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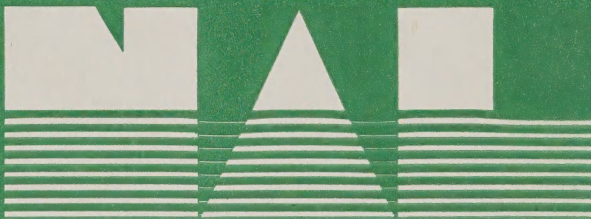
AGRICULTURE/2000

UNITED STATES DEPARTMENT OF AGRICULTURE



*Agriculture is alive with change.
It is a force without bounds . . .
without limits*

United States
Department of
Agriculture



National Agricultural Library

AGRICULTURE/2000

Introduction

In the belief that “the future is a world limited by ourselves,” the U.S. Department of Agriculture has probed intensively for a clear expression of its overall goals in the years ahead. These goals are expressed in terms of a common theme, AGRICULTURE/2000.

AGRICULTURE/2000 looks to the future in six specific areas.

Income and Abundance—reflects the pressing need for parity of farm income if future demand for food abundance and a rising level of nutrition for consumers is to be met. (Page 5)

Communities of Tomorrow—charts a course toward an environment for better living, and a revitalized rural America. (Page 15)

Resources in Action—the wise care and use of water, land, and timber. (Page 27)

Growing Nations—New Markets—concerns trade and aid—with emphasis on victory over world hunger. (Page 39)

Science in the Service of Man—the miracles we can expect from agricultural research. (Page 51)

Knowledge for Living—translating research and programs into knowledge to improve the quality of American life. (Page 63)

This booklet looks to the future not only in relation to farm and rural residents, but in terms of all the people of America. For AGRICULTURE/2000 symbolizes that better life for which we strive as a whole people and a whole Nation, and as citizens of the world. What we aspire to tomorrow depends on the plans and progress we make today.

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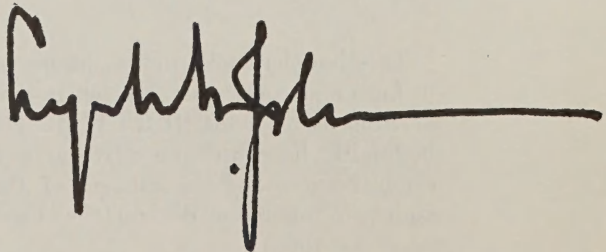
THE WHITE HOUSE
WASHINGTON

The past 35 years have been a period of revolutionary growth for American agriculture. The farmer has proved he can overcome economic depression, feed his Nation in peace and in war, and provide assistance to the world's hungry at their time of maximum need. The successes of our agricultural programs have been numerous and inspiring—yet our greatest challenges are still before us.

We must now look forward to life in the 21st century. We envision a Nation at the turn of the century where

- Rural living space will offer a viable alternative to urban congestion.
- Scientific advances will permit better and larger crop yields—at a fair price to the farmer, so that he shares fully in our prosperity.
- The quality of our rural resources—fertile soil, clean air, fresh water—are preserved and not polluted.
- A global War on Hunger brings victory over the greatest obstacles to an enduring world peace—starvation, over-population, and human want.

But we cannot wish this America into being. It will take vision and hard work in equal measure—and the time to begin is now.

A handwritten signature in black ink, appearing to read "Dwight D. Eisenhower". The signature is written in a cursive style with a long horizontal line extending to the right.

AGRICULTURE/2000

Agriculture is alive with change. It is a force without bounds . . . without limits.

Today we have entered a new era for American agriculture, promising, complicated, difficult.

But as a force without bounds our challenge is more than today—we must always look ahead and ask: What of the future?

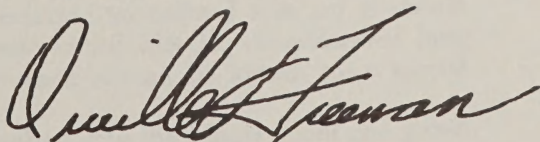
It is our responsibility to assure a free agriculture and a market place that provides incentives to produce the abundance we know and expect. We must use scientific resources to provide greater benefits for man . . . to export technical skills to free people everywhere from hunger . . . to wisely use our natural resources . . . to plan and develop sound communities in the rural countryside—the living room and playground for future Americans.

To accomplish these major missions, we are channeling the great resources of the Department of Agriculture—and its skilled, professional people—into a total, unified, and coordinated effort that replaces and far transcends the “tunnel-visioned” efforts of yesteryear. We are no longer a loose federation of agencies. Today we are a single Department . . . with mutual motivation and a single set of goals.

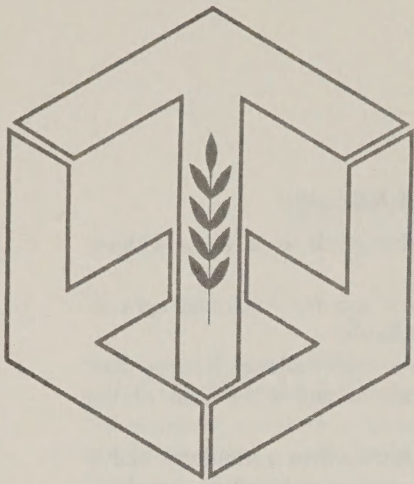
We are building toward those goals on the great accomplishments of the past and the challenges of the present . . . and we are doing it with consistency and determination.

The objectives have been identified and a deliberate course of action set. Symbolically, I have called this blueprint for action AGRICULTURE/2000. In the six policy speeches published here, I have tried to combine a look at the hard realities of today with an expression of hope and confidence that the unexcelled potential we possess can help create an ever-brighter, ever-better world.

But AGRICULTURE/2000 is more than a set of speeches. AGRICULTURE/2000 is a set of mind—a philosophy if you will—that bespeaks the drive and the forward direction of this Department and its people . . . and emphatically declares that we are working *Today* for a better *Tomorrow*.



Secretary of Agriculture



AGRICULTURE/2000

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• • INCOME AND ABUNDANCE

Man's fascination with Tomorrow is as old as man himself.

From the dawn of his imagination, he has tried to peer behind the "curtain's magic fold" to where Bret Harte said "the glowing future lies unrolled."

He has speculated about the future for profit, for amusement, out of simple curiosity . . . and sometimes for reasons bigger than himself.

And sometimes, he has, indeed, looked into Tomorrow.

Tennyson said he "dip't into the future, far as human eye could see" and "saw the Vision of the world, and all the wonder that would be."

Tennyson was a romantic. A more pragmatic poet turned his inner eye upon Tomorrow and declared that the future has never been . . . that it remains for man to make it.

The towers of Tomorrow, he said, are built upon the foundations of Today.

We're gathered here to try to turn back a corner of the "curtain's magic fold" . . . to peer into the future of American agriculture . . . to determine whether the glowing prospects many foresee will, indeed, materialize . . . to decide whether we have built the foundations for the towers of Tomorrow . . . and to anticipate, if we can, the problems we may be called upon to solve.

In just 33 years we'll turn the corner into the 21st century. What will it be like, American agriculture in the Year 2000?

No one really knows, of course. There are too many intangibles . . . too many uncertainties. But predictions are being made, and perhaps we should examine them.

As I stand here—about to tell you what may or may not happen in your own chosen field—I'm reminded of the story of the Army sergeant who had made an excellent reputation lecturing to enlisted men on a certain subject. His captain called him in, complimented him, and said he had been chosen to lecture to a special group.

The sergeant walked into the lecture room and gazed out over the biggest collection of brass hats he had ever seen gathered in one place. Every man in the room outranked him.

Embarrassed, he tried to think of a modest beginning. "There are thousands of men in the Army who know more about this subject than I do," he began. Then, realizing he was destroying his reputation as an expert, he blurted out, "But I don't see any of them in this room!"

Some Predictions

Well, I make no pretense of being an expert prognosticator. All I can do is tell you what some experts foresee for agriculture in the Year 2000.

So, let's jump to the turn of the new century and take a look at what they predict we'll find.

Some envisage the Year 2000 as the time when the American farmer finally is freed from the arduous and time-consuming demands of planting and harvesting . . . a time when he, too, enjoys leisure for the pursuit of recreation, entertainment, advanced learning, and he and the world he inhabits can provide true parity of education and opportunity for his children.

Some see him sitting in an air-conditioned farm office . . . scanning a print-out from a computer center . . . typing out an inquiry on a keyboard which relays the question to the computer.

The computer center, which he may own in partnership with other farmers, perhaps through his cooperative, helps him to decide how many acres to plant to what crop, what kind of seeds to sow, what kind and how much fertilizer to apply, exactly what his soil condition is, and what day to harvest what crop.

The experts say the fields on this hypothetical farm will bear a surface similarity to the fields of today . . . but a surface similarity only. They see a land carefully graded and contoured to control erosion and the use of precious water. They see a soil bearing nutrients to meet the specific needs of each crop, and treated to control harmful organisms, weeds and plant diseases.

They foresee virus-free plants, bred by geneticists to give higher yields in a much shorter growing period and to mature at the same time. The stalks on these plants, they say, will lend themselves to mechanical harvesting, and new uses will be made of the parts of the plant once discarded at harvest.

The experts envision all the field work on this farm carried out by automated machinery, directed by tape-controlled programs, and supervised by television scanners mounted on towers.

They predict that weather will no longer be the incalculable threat it remains in our time, for satellites will provide long-range forecasting—providing time to prepare for, divert or dissipate damaging storms.

They say robot harvesters will complete the farming operation with high-speed picking, grading, packaging and freezing . . . and will then transport the produce to transportation depots for distribution to retail warehouses.

While many find this picture of the future exciting, others find it depressing. Some contend that automation and the computer will excise the soul from farming . . . will destroy its joy, dull its satisfactions, and chill the ageless intimacy between man and his land.

But others say no. They say the farmer of the 21st century will be more deeply, intricately, and learnedly involved with the land than ever before. They point out that no computer can give a learned answer until it is asked a learned question . . . that no robot tractor can operate until a skilled human being programs it to operate.

And they contend that the joy and satisfaction of farming will come—as always—from the successful interplay between the farmer and his soil.

By the Year 2000, optimistic visionaries say, this interplay will have become so successful that yields of today will be doubled or tripled . . . that corn yields, for instance, could run from 200 to 400 bushels to the acre.

Creative Financing

Oh yes, the critics counter, but what good automation, what good maximum efficiency, what good bigness, what good record yields . . . if the producer cannot *own* the land he works? How much joy, how much satisfaction, how much ageless intimacy with the soil can a farmer reap from land that is not his?

For how, they ask, could one farmer ever hope to own a farm that big, that automated . . . that incredibly expensive?

If there is one troublesome nettle in agriculture's garden of tomorrow, this is it. Financing the farm of the future through the methods of today would be impossible, for the farms of the Year 2000 will require investments of millions—not thousands—of dollars.

The inexorable nature of the technological revolution dictates that the farms of the future will be bigger, will be better, and will be far more costly to own and to operate.

The issue then is this: If nothing is done now to insure the creation of a dynamic, new, creatively flexible system of financing farms and farming, the farms of tomorrow will *not* be owned by the farmers who work them. If this is what we want . . . we do nothing.

If this is what we do *not* want . . . if we agree that farming is, indeed, a way of life, and not just a means to

make a living . . . if we agree that it is important that the family farm system continues to make a key contribution to the strength and health of this Nation . . . then we will adjust our credit systems for tomorrow.

This we have done before. This we can do again.

From Promise to Gloom

In the brief history of our young Nation, we've seen the prestige, the influence, and the prosperity of agriculture wax and wane time and time again. Farmers built this Nation. They pushed back its frontiers. They won its independence. And they created its government.

In colonial days, 90 percent of the working Americans were engaged in agriculture, 90 percent lived on the land, and an overwhelming percentage of the national income came from farm production.

Then came the cyclical changes in the farmer's fortune. When demand outstripped farm production, the farmer gained in income and importance. When production outstripped demand, his income and his influence declined.

In the past quarter century, the cycle has come full circle once again. Throughout World War II and the Korean conflict, farmers produced to intense demand. Their importance was acknowledged and their efforts were rewarded. But the technological advances which had enabled the farmer to meet wartime production demands were to do him in when the Korean conflict ended.

By the middle of the 1950's, the genius of the American farmer had produced the supreme irony. He had become an object of derision and the target of epithets. He was accused of feeding at the public trough, of contributing to high taxes, Federal deficits, strained family budgets, and inflation. For a time flogging the farmer threatened to eclipse baseball as the Nation's favorite pastime.

By 1960, overproduction had robbed the farmer not only of prestige but had cost him dearly in earnings. By the close of that year, we had a stockpile of 1.4 billion bushels of wheat and 85 million tons of feed grains, and net farm income had plummeted \$2.4 billion in just 8 short years. In the meantime costs were rising steadily and the cost-price squeeze tightened.

The outlook was so grim that some observers held out little hope. They foresaw political abandonment of the farmer, punitive farm legislation, continued price and income depressing surpluses, little social and economic legislative concern for his unique conditions, further loss of prestige, a decline in farm living standards and farm production, and a resulting loss of natural resources as a

product of human neglect.

From Gloom to Promise

None of these things happened.

Instead, in 6 event-filled years, American agriculture turned the corner from gloom to promise.

We began to look on agriculture not as an isolated problem segment of the American economy but in terms of its contribution to the whole economy. We began to view abundance not as a liability but as an opportunity. We focused attention on agriculture as a success story.

Politicians did *not* abandon the farmer. Despite the fact that his representation in the Halls of Congress has diminished in the face of population shifts and redistricting, recognition by urban Congressmen of the farmer's new importance was such that five major pieces of farm legislation were passed in the first 6 years of this decade.

Each of these was designed to meet specific needs and solve specific problems. The record since their passage is evidence of their effectiveness.

The surpluses of the fifties are gone—replaced by sensible reserves. By the end of November 1966, the Commodity Credit Corporation investment in farm commodities was down to \$4.55 billion, a reduction of \$1.9 billion from the previous year, and about \$4 billion less than the peak investment years of 1956 and 1959.

Government is reverting to the role of referee in the marketplace—an insurer of equity instead of a participant—and except for a brief period during the forties, the market is freer today than it has been for 30 years.

In place of the “little concern” predicted in 1960 for rural America, social and economic measures have been enacted since that time which concentrate on the countryside's special problems and special needs. I speak now of the struggle to build a viable, balanced economy in rural America, of which farming is an integral part.

Rural development programs, better community facilities, new homes, improved schools, medical services, expanded electric and telephone service, water and sewer installations, and a resulting variety of new off-farm jobs are helping to bring to an ever-increasing number of rural nonfarm and small farm Americans parity of opportunity.

Farm living standards were supposed to decline. They did not. They improved because farm income increased . . . and farm income increased because surpluses diminished, the number of consumers grew, the amount of consumer income climbed, farm exports skyrocketed, and Government price support and incentive payment programs moved ahead with the time.

From the 1960 level of \$11.7 billion, net farm income

jumped to \$16.3 billion in 1966 . . . the second highest mark in history . . . and gross farm income at \$49.5 billion and net income per farm at \$5,024 set all-time records.

Of even greater significance was the accelerated graduation into "adequate size" class by family farms in recent years. One measure of "adequate size" is gross sales of \$10,000 a year or more. Since 1959, nearly 200,000 farm families have moved into that class. Studies indicate that at that level they are gaining on city workers and approaching parity of income.

But let me make it emphatically clear at this point that, despite steady progress the last 6 years, the farmer's income *still lags far behind that of other Americans*.

On a per capita basis, the farmer's income is \$1,731. Other Americans earn \$2,618 on a per capita basis.

Farm prices, though up last year, have been down the last few months, and today are *less* than they averaged between 1947 and 1949. At the same time, food costs are 35 percent *higher*.

This the farmer bitterly resents—and properly so.

This discrepancy *must be corrected*. It must be corrected because it is unfair to the farmer and therefore wrong. It must be corrected because if farmers don't get a fair return commensurate with the other segments of society, we will lose our best farmers. If that happens the entire Nation, not just the farmer, will be hurt.

And now let's look at the final gloomy prediction made in 1960—that farm mechanization and production efficiency would stage a ruinous retreat in the face of continued economic decline and political rebuff.

Once again the prediction was wrong.

From 1960 to 1965, investment in farm machinery *increased* by more than \$5 billion.

In the past 10 years, farm production per man-hour has doubled. Today, a third fewer people on farms, harvesting one-ninth fewer acres, produce one-fifth more than a decade ago. The average farmworker now supplies food and fiber for 39 persons, 24 more than he could less than a generation ago. In comparison, a farmworker in Russia feeds only 7, and a farmworker in France only 14.

In four and a half decades, U.S. productivity per acre has increased 82 percent and output per breeding animal has almost doubled. One hour's farm labor now produces five times more than it did in 1921.

The productive capacity of the American farm has provided this Nation's consumers with the best diet in the world . . . at the lowest cost in terms of percentage of take-home pay—the only realistic measure.

Moreover, the exploding technological revolution in

American agriculture has been of vital importance to the poorer nations of the world, for the resulting abundance has often meant the difference between life and death for millions of people overseas. Last year, our country shipped a fifth of its total wheat production to India, alone, and exported two-fifths more to other nations. Yet American consumers suffered no shortage of bread.

I hope this remarkable record of accomplishment in the sixties is convincing enough proof that American agriculture has, indeed, built its foundations of Today for the towers of Tomorrow.

From Surplus to Balance

In this year of 1967, we are embarked on a New Era in Agriculture . . . and we've set sail in a sound ship.

But there are reefs and shoals ahead.

Earlier, I said that historically the fortunes of agriculture in America have been tied to the production-demand ratio. When demand moved ahead of production, farmers prospered, for prices were strong. When production moved ahead of demand, the reverse was true.

In recent years, Government had used a number of management tools and programs to slow agricultural output expansion, move toward fair income for producers, and make better use of our abundance.

First, the rate of output expansion has been held down by a system of largely voluntary Government programs, which strengthened the market and also helped farmer income by means of commodity price supports and direct payments.

Second, our Government joined with private groups to develop new and expanded commercial markets—bringing successive new records in dollar exports in 7 of the past 8 years.

Third, we have carried on one of history's great humanitarian efforts under Food for Peace—a continuous stream of life-saving food and fiber that since 1955 has averaged about \$1.5 billion a year. In addition, in the last 6 fiscal years we have distributed commodities valued at \$2,439 million to needy families, schools, and institutions in the United States. In the same period, our cash donations to the school lunch and special milk programs totaled \$1,253 million, and Food Stamps given to needy American families were valued at \$158 million.

Fourth, commodities produced beyond the limits of what the commercial market could absorb at support price levels—and beyond Food for Peace needs—moved into Government-held stocks.

In the past 6 years, these stocks have declined. In fact, the combination of efforts I have just listed—bolstered by new legislation and the support of the farm and busi-

ness communities—has brought an end to the mountainous surpluses of the fifties. Prices have been strengthened, and farm income has been sharply boosted.

The New Era

I only wish I could tell you that all our problems are solved—that the balance in agriculture we are enjoying for the first time in half a century will continue—and that future farm production will keep steady pace with demand.

I can't do that. We must all accept the fact—here and now—that the technological revolution in agriculture is really just beginning . . . and that the production potential it promises for tomorrow staggers today's imagination.

Bear in mind that in 1966—with relative supply-demand balance in the marketplace—your Government in effect “bought” about 60 million acres out of production. Even with large increases in plantings to meet world demand and build reserves of wheat and feed grains to safer levels, our programs will continue to help farmers hold 30 to 35 million acres out of production in 1967.

If all that acreage, plus the steadily accelerating production per acre, were turned loose . . . the result would be chaos.

If we ignore the lessons of history, and let supply outrace demand again, we could plunge ourselves right back into the predicament of 1960, a predicament it has taken us 6 years to overcome.

We can only avoid this predicament by the disciplined use of judgement, reason and vision, for we know that adjusting farm output expansion to effective demand in the years immediately ahead will be infinitely more difficult than it has ever been before.

Yet adjust it we must.

This we can do in the New Era of American Agriculture. For by trial and error, and in the traditional pragmatic American way, we have developed the necessary tools. With cooperation among producers, the trade, agribusiness and government—we can hold a workable balance between supply and demand, maintain economic strength in agriculture, and encourage continued scientific and technological breakthroughs . . . and do it with accelerating efficiency.

For many years now, I have been talking about a National Food Budget. This implies a careful advance determination of what demand will be—how much must be provided for commercial use at home and abroad, and how much must be produced for needy, hungry people at home and overseas.

With the inducements of voluntary programs, our farmers can then set the stage to produce it. Thus they

will produce for use . . . real use . . . and not for storage.

Farmers will be able to move acreage in and out of production as it is needed . . . and the market will return fair parity income to the family farm of adequate size.

Admittedly, we can't be precise about this. Weather variations, for example, can make an enormous difference in production. With 70 million acres growing feed grains, a 10-bushel-per-acre variation means 700 million bushels difference in available feed grains. Nevertheless, we can make allowance for such variations, and the free market and the farmers' holding power can carry most of our reserve.

The next few years are both crucial . . . and promising. I say crucial because it is so important that the farmer and his government use the new farm programs wisely and efficiently. If they do—and get good results—then Congress undoubtedly will improve and extend these programs in 1969. I say promising, because the population and income explosions taking place around the world almost certainly will continue to stimulate a strong demand for food.

Prices, then, should be good . . . and income should grow for both the farmer and for the agribusiness which serves him and the consumer.

In such fashion—and with the balance that comes from mature judgement based on experience—we can look forward to a future of abundance for America . . . and prosperity for the farmer and for those who fashion and move his produce to the tables of the world.

The Future Is Promising

I conclude, then, on a note of positive optimism.

I envision the income of farm operators as commensurate with their contribution to American society—income fully comparable with that earned by other business owners, executives, and managers.

I envision a vast flow of the products of American farms to Africa and Latin America, as well as to Europe and Asia—sales for dollars through regular commercial channels.

I envision the continued contribution of American food aid and technical and capital assistance to the developing nations of the world until that time when they are able to sustain themselves.

I envision an American countryside rich in beauty—with the doors wide open to economic opportunity—a countryside which once again will exemplify the good life.

Agriculture's journey to the Year 2000 can be a useful and a pleasant one. I think it will.



AGRICULTURE / 2000

COMMUNITIES OF TOMORROW

We are now 7 years into the seventh decade of the 20th century, poised at a point in time when fundamental, widespread and irreversible change in the fabric of the United States is occurring daily.

Thirty-three years ahead of us lies the dawn of a new century. And if that date has the ring of the far-distant future, it might be well to recall just how short a period three decades really is.

We are equidistant in time today from the Year 2000 and the year 1934, the second year of the New Deal. Rural America then, as now, was in crisis, but of a different order—a crisis highly visible, affecting almost the total rural population, and part of a larger economic crisis affecting the entire Nation.

The Nation responded to this crisis, creating agencies and programs to conserve the soil, to bring electricity to the countryside, to bring agricultural supply and demand in balance, and a host of other measures which fundamentally altered the condition of American life.

What we did then profoundly affected what we are today.

Now, 33 years later, we face crisis of another order—just as acute, just as widespread as the crisis in the thirties, but with this fundamental difference: Today's crisis in rural America is a hidden crisis, largely invisible, and largely overshadowed by other, more spectacular problems at home and abroad.

Dimensions of the Crisis

The dimensions of the crisis are well known to all of you who are deeply involved in rural development. They consist of too little of everything—jobs, income, education, and services—in rural America, and a continuing one-way flow of people from country to city, damaging to country and city alike.

The crisis is neither simple nor easy of solution. It is complex, multifaceted, and feeds upon itself. Less economic opportunity in rural America means fewer jobs; underemployment means a lower tax base; a lower tax base means poorer community facilities and education; crippled education and facilities bring the problem full

circle by discouraging industry from locating in rural areas.

The result has been a rural America with space to spare, but starved for opportunity—and paradoxically an urban America with opportunity for the many, but starved for space for her residents to move in, to enjoy, to breathe.

Rural residents have roughly half the number of doctors per 100,000 people as city people; a third of the number of dentists. The amount of underemployment in rural America is equivalent to 2.5 million unemployed, 6.8 million rural homes are in need of repairs, and 30,000 rural communities need improved water and sewer systems. The educational achievement rate is some 2 years behind that of urban America and the dropout rate is 7 percent higher than in urban areas.

The City Today

An unplanned policy of exporting rural problems to the city has drawn urban America into the rural crisis. For the affluent of the city, the unchecked migration means more crowding, higher taxes, more hours consumed in commuting as urban sprawl continues unabated. For migrants already in the teeming ghettos, further immigration means less opportunity and rising despair.

One urban observer put it this way:

Our cities exact too much from those who live in them. They are not only increasingly expensive places in which to live or work; more and more, the price of city living is being paid by a sacrifice of fundamental personal freedoms.

The author of these words is no agrarian fundamentalist; he is Mayor John V. Lindsay of New York City.

The City Tomorrow

By the turn of the century, if present trends continue unchecked, Mayor Lindsay's New York will have become part of a super megalopolis stretching from present-day Boston south to Washington, D.C., and containing 56 million people. This strip city, and four other strips like it, will house 174 million Americans on urbanized land ranging in density from 660 to 2,600 people per square mile.

Residents of these five super strip cities and other urbanized areas will get up earlier, spend more time breathing their neighbors' car exhaust and return home later. Superhighways and mass transit systems will soak up increasing amounts of urban land in a frantic race to keep the city mobile. If past trends are an indication, crimes of violence will increase as urban life becomes increasingly more depersonalized and hopeless for the disadvantaged.

Nor can we count with any certainty on being rescued by technology from such a reckless concentration of people, vehicles and industry. The number of automobiles is increasing at a rate twice that of U.S. population. By the Year 2000 we will have an estimated 200 million cars in the United States—nearly three times as many as today. With this many mobile pollution sources crowded into 9 percent of the land area, even the most stringent antipollution ordinances will do little more than preserve the status quo, if that. Pollutants produced by industry, sewage plants and land development, will increase apace.

This is the world we're building, simply by allowing present trends to continue to their logical conclusion—for powerful, yet unplanned, forces are tending in the direction of even further imbalance.

Centralization Factors

One of these is tradition. The farm-to-city migration has been under way for a hundred years or more. Cities have traditionally offered better wages, education, community facilities, and cultural activities than rural areas. Both the city and the countryside have undergone tremendous change in recent years, and now many rural communities offer as much as the central city . . . and a great deal more that the urban complex cannot offer. Yet the tug of traditional thinking is strong, both on the average citizen and on those who make the plant-location decisions.

A second factor encouraging centralization can be summed up as, "them as has, gits." "Those areas which already have industry attract more, and this in turn attracts even more. The sprawling electronics complex in southern California is an example. Although overcrowding, increased taxation and snarled transportation in urban areas are making rural locations increasingly attractive, the lure of established commerce still is a powerful force.

A third factor is negative, but quite possibly more important than the other two combined: *We lack any accepted national goal in rural/urban balance.* We have never seriously asked—let alone answered—questions like these: "What is a desirable maximum size for any one metropolitan area?" "How much weight should be given to rural/urban balance in the location of Government facilities and awarding of contracts?" "Are more Federal incentives desirable to encourage rural development? If so, how much?" "What are the social costs involved in this unplanned population shift?"

In the absence of a national policy in this matter, decisions in industrial location, Government installations, contract awards, and Government program expenditures

all tend to favor urban areas.

A continued unplanned stacking up of more people in urban areas, at the expense of rural areas, is a national drift that bodes ill for the future. No one planned it this way; like Topsy, "It just grew." Nobody really wants an America of super strip cities, dotted with explosive and squalid ghettos. It is not too much to call such a drift "national idiocy," and it does no good to offer palliatives and pills to cure a disease which has literally assumed epidemic proportions.

The New Awareness

Working against this centralizing drift, fortunately, is the flickering beginning of a national awareness of the relationship between urban and rural problems, and a growing commitment to meeting the problems in rural America, rather than exporting them.

Author J. P. Lyford, in his book on the New York slums, "The Airtight Cage," articulates this new awareness by asking:

Why, for instance, must huge concentrations of unemployed and untrained human beings continue to pile up in financially unstable cities that no longer have the jobs, the housing, the educational opportunities, or any of the other prerequisites for a healthy and productive life? Why do we treat the consequences and ignore the causes of massive and purposeless migration to the city? Why are we not developing new uses for those rural areas that are rapidly becoming depopulated? Why do we still instinctively deal with urban and rural America as if they were separate, conflicting interests when in fact neither interest can be served independently of the other?

The President, speaking last September in Dallastown, Pa., said:

Not just sentiment demands that we do more to help our farms and rural communities. . . . The welfare of this Nation demands it. . . . Must we export our youth to the cities faster than we export our crops and our livestock to market? I believe we can do something about this.

We can!

Urban America, according to its spokesmen, can easily absorb one trillion dollars to make existing cities livable. Certainly we should bend every effort to make them livable. But at the same time we should devote much more to building rural America than we have done in the past, to head off even more virulent attacks of urban decay occasioned by uncontrolled growth in the future. Doing this will cost less and get better results.

Agriculture and Rural Development

Basic to any discussion of this rural development is agriculture—because a healthy agricultural plant provides an underpinning to support the rural economy. This basic resource is in a very different position today than it was 6 years ago, or even 12 months ago:

1. Food surpluses have disappeared, and an end to surpluses in cotton and tobacco is within grasp. Our reliance now is on stored acres and improved technology to produce for need, rather than on stored acres and commodities.

2. Farm income, both gross and net, has increased markedly.

3. Demand for agricultural products is strong and will remain so for the foreseeable future.

4. The free market, much praised but little used during the fifties, is now freer of Government controls than it has been in decades.

5. Our commodities are moving in the world market at world prices, because of an aggregate public and private market development program and because of pricing policies designed to meet competition.

6. There has been an accelerated graduation into "adequate size" class by family farms. Measuring "adequate size" by gross sales of \$10,000 a year or more, we know that nearly 200,000 farm families have moved into that class since 1959.

More financing and technical assistance, both public and private, should be extended to farmers presently in the "less-than-adequate" size, to allow those farmers to expand operations and to take advantage of modern technology. We should continue to keep the door open for those who wish to remain in commercial agriculture.

Yet there are many operators who do not wish to expand, or lack the capacity to, because of age, physical disability, grossly inadequate resources, or other limitations. It is critically important that there be a place for these farmers in rural America also—for urban America has no place for them.

Take the case of a man 45 years old whose farm has failed. The small town where he's done his modest shopping has no job for him, nor is there any within commuting range. And so, in a desperate search for work, he moves to the city.

He has no money, so he doesn't have much of a choice in housing . . . he settles in the decayed heart of the city. His limited education puts him out of the running for a job. His limited skills are useless in the city . . . for who needs a man to plow a straight furrow in an asphalt field.

He is one of thousands . . . all disenchanting, all strangers in a strange land. Families break asunder; children are infected with the virus of the ghetto and yet another generation is crippled. This is the human cost we're talking about.

It is true that our farm commodity programs have helped the less-than-adequate farmer—to an extent. From

1959 through 1965 the class of farmers with gross incomes below \$10,000 yearly increased their per farm net income by some 19 percent. Their off-farm income, with greater job opportunities in recent years, increased some 30 percent. Yet their earnings are far from adequate, and it is unrealistic to expect the farmer with "40 acres and a mule" to enter the mainstream of commercial agriculture.

Commodity programs are not welfare programs; they do not provide the whole answer.

Certainly programs are necessary, and certainly they should be improved. Yet those who stake *all* their hopes on just one set of solutions for rural America perpetuate a cruel and dangerous illusion. Rural development must proceed on more than one track.

We *can* offer a place in the countryside to those who, for one reason or another, do not find a rewarding place in commercial farming, or who wish to farm part time and supplement their incomes with outside employment.

New Tools

The need for such a second track has called forth an array of Federal programs to help rural America. A partial list includes the Food and Agriculture Act of 1965, the Rural Water Systems and Sanitation Act, the Housing and Urban Development Act, the Appalachian Regional Development Act, the Manpower Training and Development Act, Elementary and Secondary Education Act, and the Public Works and Economic Development Act. Local rural development committees, local Resource and Conservation Districts and local leadership give us an apparatus to use these tools.

So far, we have accomplished a great deal. USDA made more rural housing loans during the past 3 years than in all the prior years since the program began in 1949. In the first 6 months of 1966 alone, grants and loans for rural sewer systems totaled \$13 million and helped 46 communities. Today, nearly 30,000 farmers are engaged in marketing recreation for profit. Since 1963, construction has begun on 256 small watershed projects—the largest number of any similar period in the 12-year history of the program.

Measured against what had gone before, accomplishment has been great. But measured against what *needs* to be done, it is apparent that we have only scratched the surface.

But we are making the attempt!

In my Department, the old county-by-county and agency-by-agency approach is giving way to State and county Technical Action Panels, made up of experts in many disciplines, and keyed to multicounty development.

Where local leadership is aggressive and strong, the panels provide a ready source of technical aid; where it is lacking, Technical Action Panels seek to stimulate and involve local leaders in finding answers to local problems.

This new approach points up a basic change in Department thinking. Since its founding, and until very recently, the Department has been almost exclusively concerned with agriculture—keeping its records, researching its problems, conserving its soil, and educating its constituency in scientific farming. All of these functions are still necessary and are still being performed. But in the past 6 years the Department has begun to address itself to the problems of the *other* rural America—an America where poverty is ingrained, opportunity is lacking, and basic community growth facilities are sometimes nonexistent.

These problems, which are essentially human and economic, have been approached within the existing agency framework, and it has taken some basic reorientation on the part of all of us. In 1961, for instance, nearly all Farmers Home Administration loans went to farmers. During fiscal 1967, farmers will receive about 50 percent of the FHA loans, and nonfarm rural residents 50 percent. This doesn't mean farmers are being short-changed, since the total dollar amount loaned to farmers is higher this year than in 1961. It *does* mean more resources and a new priority for the problems of the small farm and nonfarm people in the countryside.

Another important ingredient in rural development is a re-evaluation of the administrative machinery we need to accomplish the job.

President Johnson pointed up the problem in his State of the Union address when he said:

. . . [We] are making and breaking new ground. Some [of our programs] do not yet have the capacity to absorb well or wisely all the money that could be put into them. Administrative skills and trained manpower are just as vital to their success as dollars, and I believe these skills will come. But it will take time and patience and hard work. Success cannot be forced at a single stroke. So we must continue to strengthen the administration of every program if that success is to come—as we know it must. . . . Every program will be thoroughly evaluated . . . where there have been mistakes, we will try very hard to correct them.

Such an evaluation is taking place today in the Department of Agriculture, in other Federal agencies, and in many of the States!

A Rising Tide Of Interest

President Johnson has a deep and abiding interest in rural development. In recent Executive orders, including Number 11037, issued last fall, the President made this

interest unmistakably clear:

1. He directed Federal agencies to coordinate their boundaries for federally assisted planning and development districts with existing State planning boundaries, to eliminate confusion and overlap.

2. He directed the Secretary of Agriculture and the Director, Bureau of the Budget, to review *all* existing programs with Cabinet and other Federal officials to insure that rural areas receive an equitable share of existing Federal program benefits, and to submit proposals for administrative or legislative changes needed to obtain such equity.

3. And he gave the Secretary of Agriculture responsibility within the Federal establishment for identifying agricultural and rural development problems which require the cooperation of various Federal departments, so that these programs may be better coordinated, and duplication eliminated.

These are a few of the recent Federal actions that bear directly on the problems of rural America.

But this is a big, diverse country and Federal actions alone won't solve rural America's problems. This is a point which cannot be stated too strongly. Nobody in Washington can prepackage a cure for the ills of rural America, ship it out to the country, and expect it to work. The Federal Government has literally hundreds of programs which *can* work, but making them effective takes local initiative, local leadership, and local planning.

We have learned that where this local leadership exists, a pipeline through which to channel our development efforts also exists. Without it, development efforts are ineffective.

We have also learned the lesson of planning on a multicounty basis. It is difficult for every single rural community to offer a full set of community services of the calibre needed for sustained growth.

But a group of counties, usually with a small- or medium-sized city at its center within easy commuting range, *can* provide the framework needed to make Federal and State programs effective. When united for planning purposes, the people and governments of such a functional community can assess the area's needs and determine the combinations of internal and outside resources essential to spark growth.

The multicounty approach is being taken by a number of States, including Kentucky, Iowa and Georgia, among others. The Appalachian Regional Commission and other regional groups are exploring this approach. Its effectiveness is becoming increasingly apparent.

Achievement of our development objectives will take planning, dedication, hard work, and some basic re-

thinking of long-cherished folkways.

Planning is paramount. Building bigger and more sprawling strip cities can proceed without real planning; but upgrading the communities we have now—and building new communities—demands it.

Finally, of course, we have learned that we need to know a great deal more about rural America and its problems than we do now. To find answers to these questions, and to come up with effective solutions, President Johnson has established a Committee on Rural Poverty, which I am privileged to chair, and a National Advisory Commission on Rural Poverty, chaired by Governor Breathitt of Kentucky.

And while the Commission and Committee are seeking answers, the Department, in cooperation with other Federal Departments, the States, local government, and volunteer groups, will be pushing its own rural development programs at an ever-increasing tempo. In 1967, among other actions, we will:

1. Provide \$33 million in Economic Opportunity loans to help 13,000 low-income families and some 390 cooperatives composed of low-income families.

2. Provide \$435 million in rural housing loans for 48,000 families.

3. Help finance about 200 community recreation centers in rural areas.

4. Finance \$304 million in loans and grants for construction or improvement of some 1,700 central water and waste disposal systems in rural areas.

5. Assist 10 additional local groups with Resource Conservation and Development projects.

6. Approve construction of another 63 multiple purpose small watershed projects with 45 reservoirs.

7. Help 8,500 additional rural landowners with income-producing recreational developments involving 150,000 acres of land.

8. Supervise harvest of another 12½ billion board feet of National Forest timber, providing 700,000 man-years of employment, sharing \$40 million of revenue with local governments for roads and schools.

9. Reforest 280,000 acres of timber lands, improve timber stands on another 440,000 acres, and build another 295 recreation sites in the National Forests.

The Matter Of Choice

What we in rural development are all fundamentally concerned with, it seems to me, is the matter of choice—of offering alternatives to ever larger cities in the future. President Johnson put it this way:

History records a long hard struggle to establish man's right to go where he pleases and live where he chooses.

It took many centuries—and many bloody revolutions—to break the chains that bound him to a particular plot of land, or confined him within the walls of a particular community.

We lose that freedom when our children are obliged to live someplace else . . . if they want a job or if they want a decent education.

Not just sentiment demands that we do more to help our farms and rural communities . . . the welfare of this Nation demands it.

I believe that we *can* choose what kind of an America our children will inherit 33 years from now, for we are not the blind pawns of Fate, but rather the shapers of our own destiny.

I believe that we as a Nation *should* grasp this chance to shape our destiny—grasp it here and now, without further delay—before the chance for choice eludes us.

Address at Conference on Rural Poverty, sponsored by National Association for Community Development, Arlington, Va., January 30, 1967.







AGRICULTURE / 2000

• *RESOURCES IN ACTION*

My message today, "Agriculture/2000—Resources in Action," is the third in a series exploring what rural America will be like at the turn of the century, just 33 years from today. Our subject is the resource and conservation challenge of the remainder of this century and the next.

It is fitting that we examine this subject together. No organization has done more to enhance the resource base of this country than the National Association of Soil and Water Conservation Districts. The whole thrust of NASCD's efforts these past 23 years has been a better future for all America through conservation and development practices.

This year, 1967, is a good year to take a long-range look at "Resources/2000" for we are at a point in time equidistant from 1934, which marked the first full year of operation of what is now the Soil Conservation Service, and the dawn of the 21st century.

It has been said that we view the future "through a glass, darkly." Yet we can predict with some accuracy the major outlines of the Year 2000:

- By the dawn of the next century, we shall have become a Nation of 300 million Americans, having added to our present population the equivalent of the total populations of 10 New York Cities or 54 Washington, D.C.'s.
- In the Year 2000 these Americans will exist on the same number of square miles—some 3.4 million—as today. The same amount of fresh water will fall from the skies then as now, but we shall need twice as much water. We shall be fed from the same thin layer of top-soil that feeds us today, but need one-third more food.
- It will be a richer America, in dollars, than today. With the gross national product rising an average of \$250 per person every year, the industrial and commercial output alone will top 1 trillion dollars in 2000.
- Americans will be earning more—but working one-third fewer hours. The demand for outdoor recreation will have increased three times over the 1967 level.
- Land use will be more intensive than today. Housing for another 100 million Americans will be built; roads

for three times the number of automobiles as today will have been built; space to dispose of another million tons of solid waste every year will have been found.

The Quality of Our Environment

This face of the future we can predict with some certainty because quantity is always easier to measure than *quality*. But what of the quality of American life in the next century? Here the glass darkens, and split-images appear.

One image reflects an almost completely urbanized America, with 240 million people crowded into 9 percent of the continental land mass in huge, sprawling, anthill cities. Prophets of this America see five giant strip cities housing three out of every five people in urban areas more densely populated than present-day Japan. Water will be dirtier, they say, air more full of smog, and for most Americans the solitude of open spaces will have vanished beneath the blades of the conquering bulldozer.

This particular view of the future has wide currency. *And it will happen, if nothing is done to alter present pollution trends, migration trends, resource inputs, and land use policies.*

But this is not the only image in the mirror. Other spokesmen—not many so far, but a steadily growing number—envision an entirely different America. Nothing is fixed about the future, they say. Rather the future is what we make it—for we are not the blind pawns of fate, but rather the masters of our own destiny. These prophets share the belief of that perceptive French visitor to our shores, Alexis de Tocqueville, who in 1830 observed: “. . . in the [American’s] eyes what is not yet done is only what he has not yet attempted to do.”

What kind of an America do these more optimistic prophets see? Thirty-three years in the future they see:

- A land of 300 million Americans living in less congestion than 200 million live in today.
- A countryside USA, dotted by new towns and growing rural communities where the benefits of community life are matched by the rich beauty of the countryside.
- An agriculture fully sharing in the national prosperity—with full parity of income an accomplished fact.
- Urban centers free of smog and blight, with ample parklands within easy reach of all.
- A land free from devastating floods, clear rivers scrubbed of pollution and silt, and sparkling air.
- And new industry and factories dotting rural America, providing the necessary economic underpinnings for the good life in the country.

This is the kind of America/2000 I believe in. It is the

kind you believe in, too, for every program of the National Association of Soil and Water Conservation Districts is pointed toward building this kind of America.

This is your policy. You believe that a constructive conservation and resource policy is the key to building this kind of America. And you know that such a policy is greater than just the sum of its component physical parts—water, air, and soil—that at the center of such a policy is man himself.

Means and Ends

This basic objective is carried out in different ways. In forest management it means constant reforestation for sustained yields. In soil conservation it means preventive and restoration measures for continued fertility of the soil. In Wilderness Areas it means stewardship of a particular geographic area so that more than one generation may see and use it. But it means use, in all three cases. For man and his ecology are one and inseparable.

There is nothing new about this concept. Gifford Pinchot, USDA's first Forest Service chief, realized this when he wrote, over half a century ago:

From birth to death, natural resources, transformed for human use, feed, clothe, shelter, and transport us. Upon them we depend for every material necessity, comfort, convenience, and protection in our lives. Without abundant resources, prosperity is out of reach. Therefore the conservation of natural resources is the fundamental material problem.

I quote Pinchot for two reasons. The first is to illustrate that the U.S. Department of Agriculture has been in the conservation business for a long time, that its program and responsibilities are much broader than agricultural commodity programs alone (important as these are). Second, and more important, however, is this. Conservationists—and I think everyone in this room is one—are often criticized for “putting birds and bees ahead of people.”

No statement could be more specious. Conservation is people. Conservation is a *material* problem. But it goes way beyond that. The Bible says, “What is a man profited, if he shall gain the whole world, and lose his own soul?” We could well ask, “What profit it us, the richest nation on earth, if our own people have no open space to enjoy, no woods for our children to roam in, nothing within driving distance except subdivisions, concrete, and ‘No Trespassing’ signs?” This is what conservation is all about.

Pinchot realized this, and you realize it, but many remain unconvinced. One of our biggest jobs, it seems to me, to build the kind of United States we want in the Year 2000, is to convince the public that conservation is one of the most important, if not *the* most important

dollars-and-cents issue facing us today. And to become convincing advocates, we first have to understand how we got where we are today.

Three Great Waves

The conservation movement developed in three great waves, each building upon the flow of the one going before it; each cresting in reaction to widely prevalent abuses of the environment; and each separated by an ebb of public indifference and inaction.

Very roughly, the three great waves can be categorized as follows: (1) 1890-1912, the Gifford Pinchot-Theodore Roosevelt era; (2) 1933-1940, the Hugh Bennett-FDR era; and (3) the present.

The first great wave began to roll in, in the late 1890's with the establishment of forest reserves from what remained of the public domain. This system evolved into our present National Forest system.

It was an era of great men. John Muir, Gifford Pinchot, and others led a tide of public outrage against exploiters of the public domain, and Theodore Roosevelt, by Executive order, established a system of National Forests administered by the Department of Agriculture. He named Gifford Pinchot as the first Chief of the U.S. Forest Service.

Assignment of the Forest Service to the Department of Agriculture was significant. In making it, Roosevelt said,

In the Department all problems relating to growth from the soil are already gathered . . . and all the sciences auxiliary to forestry are at hand for prompt and effective cooperation.

Up until this time, except for isolated instances, the treatment of forests had been similar to that of the mines. The objective was simply to mine timber from the earth in the same manner gold or silver was mined. The concept of timber as a *renewable* resource was foreign to most people.

Pinchot and Roosevelt made the principle a reality, and today it is widely accepted by both public and private timber management.

The first wave also established the principle of multiple use, which can be stated as follows: The same National Forest which yields timber for human use, can also provide recreation for human use. Moreover, it can graze cattle, sustain mining, and serve as a water collector and water protector for the use of people living downstream.

All of this may seem self-evident now, in 1967, but it was a radical idea for its time, and it spawned bitter opposition.

After Pinchot and Theodore Roosevelt left the national scene an ebbtide set in. But in the thirties, a second

great conservation wave crested in response to yet another crisis. The very earth of the Great Plains was vanishing in devastating duststorms, and destructive floods in the Midwest scoured the rich heartland of America. These events were compounded by a crippling depression.

The second crusade gave birth to the Soil Conservation Service, with another great conservationist, Hugh Hammond Bennett, as its spokesman.

Bennett's policy was to develop techniques which the private landowner could apply to insure that his soil and water worked in harmony to produce for mankind.

President Franklin Roosevelt, realizing that three-fourths of the Nation's land was in private hands, that most of the soil conservation work could only be done by farmers themselves, and that conservation was an integral part—could not be separated from—farming, assigned the fledgling agency to the Department of Agriculture.

The soil conservation movement flourished and has made steady progress since, firmly supported all the way by the National Association of Soil and Water Districts. Today there are 3,000 local soil conservation districts. Of these, 2,400 have signed modernized working agreements. In 14 States, all districts are updated. Last year, three-fourths of the small watershed work plans completed were multipurpose, including recreation, wildlife habitat, or municipal water benefits, as well as flood prevention.

But the broader conservation movement, of which soil conservation was a part, moved from stage center in the national arena to the wings under the impact of World War II and Cold War problems.

Yet during the ebb of two decades of inattention a third conservation wave was building and today is at the flood.

The crisis this time is equally severe and far more widespread than the two that preceded it. It affects a Nation of 200 million Americans today, compared with 90 million in Pinchot's time, and 125 million in the thirties.

A similarity exists between this era and the preceding two. Again, we are faced with an abuse of natural resources. But there are also these deep, fundamental differences:

1. Whereas the first conservation wave concerned itself primarily with forests, and the second with soil and water, response to the present crisis must concern itself with the totality of man's environment: soil, air, water, open space to move in.

2. Whereas the first two crises were concerned with

repairing the damages of a rampaging nature disturbed by man, the third is concerned with restoring and preserving an environment on its way to being destroyed by man himself, by his pollutants, his land use practices.

3. Effects of the first two crises were limited geographically and to certain segments of the population. Today's crisis is continental in scope and omnipresent in its intrusion into every American's daily life.

It is, in short, a "people" crisis. Other nations have known the cutting edge of population pressure on available resources for centuries. It is new to us, and we are bewildered. It is not a case here, as it is in India, of shortage of resources to sustain life itself; rather it is a case of a misuse of the resources that make life worthwhile—a shortage of available open space, an excess of pollution, a piling up of too many people in too little urban space.

This is new to a frontier people who, for 300 years of their history had what Bernard DeVoto called "an internal, domestic empire" in the Great West, and space to spare elsewhere.

The People/Resources Problem

There is no shortage of specific examples to illustrate the people/resources problem:

- Today a majority of Americans, urban and rural alike, in all sections of the country, live near polluted waters. Every major river system is polluted. Fifty-four percent of all Americans described nearby waters as "severely polluted."
- Today a majority of Americans are breathing polluted air. Air in every single urban area in the United States is polluted. So is air in many rural areas, and in some, smog is doing more damage than even insects to crops.
- Open space for picnicking, camping and solitude—for the 70 percent of our population living in urban areas—is fast disappearing anywhere within easy driving range.

Today's Americans, unlike any people who went before them, are living in a new environment dominated by technology, rather than by nature.

This new environment and the conservation crisis it has precipitated constitute one of our most serious domestic problems. But there is more cause for hope than despair. Paradoxically, because the crisis is touching almost every American—from fathers looking for fishing spots, to small boys looking for a patch of woods to play in—the public response to this crisis is more broadly based than ever before.

Examples of this response are all around us. At last count, five States had passed laws to preserve open space

and to alleviate urban sprawl. Kentucky has just passed stiff legislation to help curb the ravages of strip mining. The conservation wave is again at floodtide and government is responding.

On the national level, the last two sessions of Congress passed more conservation, antipollution, and natural beauty measures than any other session in history. There was Highway Beautification, the Land and Water Conservation Fund, the Water Pollution Control Act, the Clean Air Act Amendments, Amendments to P.L. 566, and authorization for Resource Conservation and Development.

Laws aren't everything, of course. The laws of the 1900's and the 1930's would not have succeeded without the wise administration of two great conservationist Presidents.

But a third great conservationist President is in the White House today, and his First Lady is the Nation's leading advocate of natural beauty. Like the two Roosevelts, President Johnson is focusing the national attention on conservation, because he believes in it and because he understands it. The depth of his understanding is apparent in this statement:

Our conservation must be not just the classic conservation of protection and development, but a creative conservation of restoration and innovation. Its concern is not with nature alone, but with the total relationship between man and the world around him. Its object is not just man's welfare, but the dignity of man's spirit.

So now, with all these things going for us—broad-based public support, new legislation, and strong Presidential concern—the central question as we look to the America/2000 we want is not—“Can it be done?”—but rather, “How can it be done?”

Plan of Attack

Specifically, we must now turn our attention to these four broad areas in order to reach our goals: 1. Quantity of Effort; 2. Broadened Concepts of Multiple Use; 3. A Planned Land Use Policy; and 4. Preservation.

1. *Quantity of Effort*: At the time President Kennedy took office in 1961, he inherited a Federal budget of roughly \$2.4 billion for conservation and natural resource measures. President Johnson's 1968 budget calls for \$3.9 billion, *more than a 60-percent increase!* All this took place in 6 short years, and I don't have to tell anyone in this audience what these extra conservation dollars have accomplished.

Yet as a Nation, we must be prepared to devote much more to conservation and resource development than we are now investing. American voters will make decisions on this question on each of the 16 national election days

between now and the Year 2000. Washington can't make that decision, only the Nation can. On it will depend how many acres of forests and parks and wilderness we have, how many more National Recreation Areas we establish, how many more multi-use watershed projects are constructed.

But quantity alone is not enough. We also need—

2. *Broadened Concepts of Multiple Use:* Multiple-use has been a Department of Agriculture policy for more than half a century. It is a well-accepted practice in forestry management and just last year was applied to the eight new National Recreation Areas. Multiple use, today, is an integral part of watershed development. And more and more farmers are diversifying use of their land. Many are getting help from USDA in establishing recreation for profit and pleasure on private lands.

Another 100 million Americans in the Year 2000 means greatly increased single purpose land use for housing, highways, and industry. The remaining land will have to serve more than just one use to provide the open spaces and recreational areas 300 million Americans will demand.

To do this will take new concepts in zoning, perhaps providing for farmland on the urban fringe; it will take new and expanded programs like those of the Agricultural Stabilization and Conservation Service, Soil Conservation Service, and Farmers Home Administration, already successful, in a modest way, in providing new recreation opportunity.

Let me make this point clear. I'm *not* talking about taking private land away from people. What I am saying is that our traditional single-purpose use of most of our lands isn't enough for the 21st century. If we are to live in and enjoy the kind of United States I spoke of earlier, we must fully utilize every acre of land.

Implicit in this concept is—

3. *A Planned Land Use Policy:* Soil Conservation Service estimates we have some 682 million acres of land in the contiguous 48 States suitable for cultivation. This land feeds us now, and it will have to feed us in the Year 2000. Planning to preserve this prime farmland is of the utmost importance, simply because feeding our people is land's most important use—we can't exist without food.

But what are we doing? Every day, we're losing thousands of acres of this prime farmland to subdivisions, highways, airports. We're burying it under concrete or houses, and it can't be jackhammered clear again.

But more is involved than just farmland. We're also burying land needed for recreation and open space, pushing these open spaces further and further out of the reach of most people.

And so we need a sound land policy, one which sorts out the lands best suited for recreational needs, agriculture, commerce, housing, and highways; a policy which establishes priorities and makes the best use of a fixed limited natural resource.

Such a policy means building highways on unproductive land, rather than across rich topsoil. It means opportunity for local communities to identify land needed for future recreation, and a way to finance the land *now*, before urban land costs have doubled again, as they did in the last decade.

Such a policy requires information of the type now being gathered in the USDA's Land Use Inventory, but on a much greater scale, and in much more detail.

This concept of planned land use incorporates two elements. The first is use—deciding the best use to make of our land. The second is preservation—preserving land suitable for crops, open space, recreation. Which brings me to our final point—

4. *Preservation*: The National Forest Wilderness Areas illustrate this concept in its classic sense of preserving a resource in its primeval state for human use—in this case, for people to hike, camp and boat free from the works of man. I believe in this kind of preservation and have added some 2 million acres of wilderness to the system, by Executive order, while I have been Secretary of Agriculture.

But this isn't the only kind of preservation we need. In a somewhat different, and larger sense, preservation means "preventive conservation."

The Agricultural Research Service is applying it as we discover methods to practice the more intensive farming we will need in years ahead—which means more fertilizers and chemicals—without damaging man's ecology. This brand of preventive conservation consists of careful testing of pesticides and herbicides before they go into use, careful regulation and education in application, monitoring their effects on the environment, and research to discover nonchemical methods to control pests.

This principle of preventive conservation needs to be applied promptly to all forms of air, water, and soil pollution at the source.

In the long run, this kind of preventive conservation is much less expensive than restorative conservation. More important, some ecologies, once destroyed by man, can never be brought back, no matter what we do. All our billions, all our technology, can never bring back the tons of topsoil from the Gulf of Mexico to the American heartland. Nor can we ever bring back a single acre of Wilderness, once it is destroyed.

Let's Build America

We are a Nation bedazzled by technology, and addicted to crash programs. But there are no instant ecologies or instant forests. And so, in the final analysis, we must devote much more attention in the future to *assessing* each new technological development for its ultimate impact on man. I hope it is never said of this generation, as Stephen Vincent Benet said of another, "They thought, because they had power, they had wisdom also."

And finally, let me say this: What we have discussed today is not a dream. It can be a reality. We are talking about the kind of America that President Johnson envisioned when he said:

... here in America, we started out to do more than simply endure. We intended to live as man should live, working hard, raising families, learning, building—and breathing clean air, swimming in clean streams, finding a part of the forest or shore where nobody else was.

If we are to have that America, we shall have to master the consequences of our own prosperity—and the time to begin is now.

Let us begin, and let us persevere, so that we may build the America we want, and we need, in the Year 2000.

Remarks at the National Association of Soil and Water Conservation Districts, Cincinnati, Ohio, February 6, 1967.







AGRICULTURE/2000

• **GROWING NATIONS, NEW MARKETS**

Earlier in this series, I talked about *Agriculture/2000—Income and Abundance*, *Agriculture/2000—Communities of Tomorrow*, and *Agriculture/2000—Resources in Action*. Today I intend to explore with you an even broader and deeper subject—the role of agriculture in developing—by the Year 2000—a world free from hunger . . . a world largely insulated, thereby, from the tinder of international tension.

Admittedly, hazarding predictions about the future implies some arrogancy of omniscience. But no man, of course, is omniscient—and least of all the Secretary of Agriculture. The rapidity of change in our own lifetime staggers the imagination and deters even the brave from anticipating what the world will be like 33 years from today.

The changes, the progress, and the disappointments which will occur between now and then will, I'm sure, far exceed those that have taken place since 1934, the second year of the New Deal.

Consider the world of 33 years past. How many then—peering into the future in 1934—foresaw today's wonder drugs . . . the victory over dread poliomyelitis . . . the popular universality of television . . . the phenomenon of 6 percent of the population supplying the food needs of 197 million fellow Americans and millions overseas . . . the jet airplane . . . walks in space . . . and the imminence of man's first visit to the moon?

And, on the darker side, how many foresaw the impending holocaust of World War II . . . the bloody frustrations of Korea . . . the awesome tapping of nuclear energy . . . slums, squalor, and strife in the streets in the midst of unprecedented social advance and economic prosperity . . . or the hovering spectre of worldwide hunger?

Of only one thing can we be certain. Changes will occur far more rapidly in the 33 years ahead, than they did in the 33 years before.

This fact alone compels us to think about the future . . . to postulate alternatives . . . to look to the experts for every glimmering of knowledge, for every bit of information we can marshal in an all-out effort to chart the

course to a better world . . . a better life. We can't afford to do less. The luxury of lead time to correct mistakes is a luxury of the past.

With this in mind, it behooves us to establish a priority of effort . . . a determining of what first must be done.

Circumstances already have determined that priority. In his State of the Union message, on January 10, 1967, the President described it in these words:

Next to the pursuit of peace, the really great challenge to the human family is the race between food supply and population increase. That race tonight is being lost.

The President did not set this priority casually. His words were emphatic. In this winter of 1967, the War on Hunger is being lost.

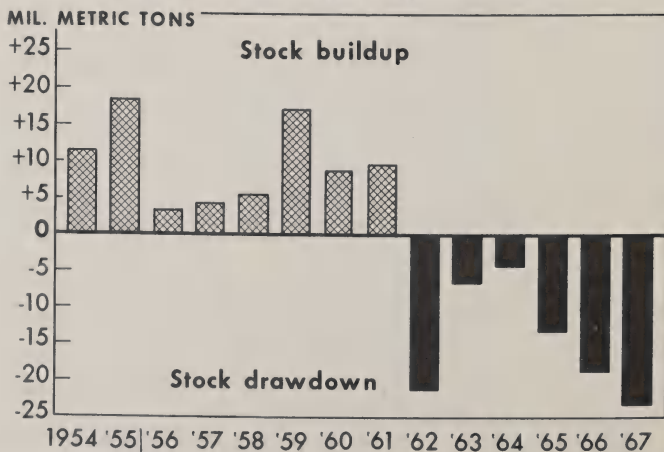
Unless something is done *now*, the world's population will double by the Year 2000—rising from 3 billion people to more than 6 billion. When we consider that it took from the beginning of time until the present decade to reach a world population of 3 billion . . . and will take only 33 more years to add the second 3 billion . . . this projection becomes both awesome and threatening.

And . . . the most rapid gains in population are taking place in those lands least able to cope with them.

The developing nations of Asia, for instance, now contain more than half the total number of people in the world . . . and are adding nearly a million more each week!

From net grain exporters a generation ago, the developing nations have now become importers of more than 30 million tons of grain a year in their desperate efforts to feed a populace that can no longer be sustained by the primitive tillage of their own soils. Nearly one-fifth of the United States' wheat crop was shipped to India to

CHANGES IN WORLD GRAIN STOCKS



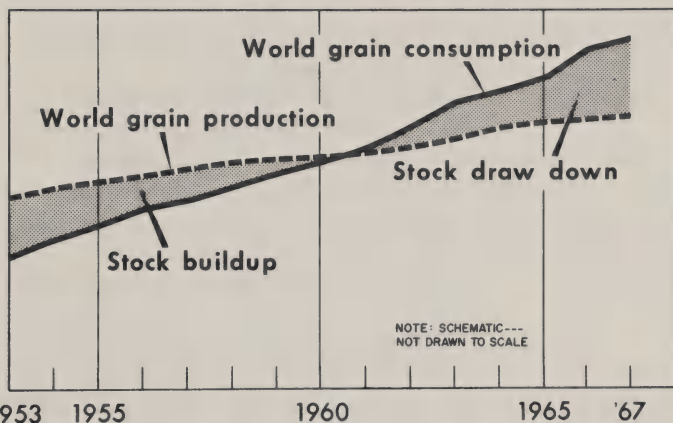
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stave off famine in 1966. Similar needs are developing again this year. Yet the quantity of grain shipped in 1966—so huge it was shipped in the largest flotilla assembled since D-Day—was still not enough to maintain India's food consumption levels of the early 1960's.

Recent world food trends are alarming. For 6 years now world grain stocks have been declining. Each year since 1961 world food consumption has exceeded production. This excess of consumption over production was made possible by drawing down stocks.

WORLD GRAIN PRODUCTION NOW LAGGING BEHIND CONSUMPTION



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Now that grain stocks are reduced to near-minimal levels they cannot be reduced much further. This means that the lines in figure 2 must come together again. The production line must go up, or the consumption line will come down.

The Alternatives

If nothing is done to alter present trends . . . if nothing is done to slow population growth and accelerate food production . . . the outlook for the Year 2000 is a grim outlook, indeed.

With fully four-fifths of the 3-billion-people increase projected by the turn of the century added to the developing countries, where food already is in short supply, we can then expect to find by the Year 2000:

A world where the developed nations sacrifice compassion on the altar of survival—feeding only themselves as they huddle behind arms-and-tariff-protected borders.

A world where the trickling food supply of the hungry lands runs dry before it reaches everyone . . . and millions succumb to starvation.

A world where nutritional hunger completes the grim

job of caloric hunger . . . and leaves in its wake millions of stunted, retarded, blinded, or ricketed children. And to those who survive the perils of childhood with nothing worse than hollow eyes, distended bellies, and spindly limbs will befall the responsibility of leading their haunted, hopeless nations.

A world where hopelessness breeds hostility, where the ever-growing gap between the haves and the have-nots first provokes riots in the streets . . . then insurrection and the toppling of governments . . . then finally, desperate international aggression.

When this occurs, the developed nations that did not act when there was still time to act will learn the harshest lesson of all—that there is no peace, there can be no security in a world where population smothers the land and hunger takes to the streets.

Centuries ago, the Roman philosopher Seneca observed that “a hungry people listens not to reason, nor cares for justice, nor is bent by prayer.”

Last spring in Montreal, Defense Secretary McNamara pointed out that over the past 8 years serious outbreaks of violence occurred far more frequently in the have-not nations than in the richer countries. He said:

Since 1958, only one of these 27 (rich) nations has suffered a major internal upheaval on its own territory. Among the 38 very poor nations—those with a per capita income of under \$100 a year—not less than 32 have suffered significant conflicts. Indeed, they have suffered an average of two major outbreaks of violence per country in the 8-year period. . . . What is worse, it has been predominantly conflict of a prolonged nature. There is an irrefutable relationship between violence and economic backwardness. And the trend of such violence is up, not down. When people are hungry and poor, they look toward any promise of a better life.

It should be apparent, then, that if the world pursues its present course . . . if the gap between the haves and the have-nots continues to widen . . . if population expansion is not controlled and food production greatly increased . . . the world of the Year 2000 will be a grim, sullen, hate-filled planet tottering on the brink of self-destruction—if indeed it hasn't blown itself up long before it reaches the turn of the century.

But need it be? *Not if the primary problem of people-and-food imbalance is solved in the next 33 years.*

A Better World

Suppose, for instance, that the hoped-for advances in family planning—particularly in the developing countries—*do*, indeed, occur.

Suppose that by the turn of the century the world has—not 6 billion—but only 4-1/2 or 5 billion.

Suppose effective means *are* found to increase substan-

tially the world's total food production . . . that the developed world's knowledge, technical skills, and investment capital *are* transplanted to the hungry nations to energize their transition to modern agriculture . . . that these emerging nations *are* transformed from concessional to commercial markets.

And supposing all nations finally *do* perceive the folly of insulating themselves from truly *international* dialogue . . . and truly *international* commerce.

What then?

A better world—

- A world where hunger and hostility are fast vanishing from the earth.
- A world where young nations are as healthy as the old . . . all but freed from the need of outside assistance . . . their economies soundly based on productive agricultures . . . able to grow much of what they need . . . and able to buy much of what they cannot grow.
- A world where the children of young nations are not gaunt, dull eyed, malnourished, and illiterate . . . but tall, strong, clear eyed, and educated . . . physically and mentally ready to assume, in time, the yoke of leadership of nations that have found their places in the sun—and no longer need covet their neighbor's bounty.

Under such conditions, the resulting serenity and security may well melt away the final walls between nations. With tariffs abolished, the free flow of goods, of people, of ideas, and of the fruits of science, research, and culture can stimulate global prosperity and insure a lasting peace.

Barring natural calamity—or the unthinkable war—perhaps this can all be ours by the Year 2000—if *we win the War on Hunger*.

Weapons and Tools

We've seen the alternatives. Now we can properly ask:

What will it take to reach that better world by the Year 2000?

What will it take to solve both sides of the food and people equation?

What will it take to win the War on Hunger?

It will take knowledge. It will take resources. It will take the means to organize resources and apply knowledge. It will take widespread awareness of the urgency of the problem. And it will take skill and determination.

I'm confident we already have the knowledge, the resources, and the means. I'm also certain the world is aware of the problem and is rapidly coming to realize what must be done to slow population growth and spur food production.

The War on Hunger *can* be won. We *can* have that better world I've pictured for the Year 2000 . . . if we have the determination, the persistence, and the skill to mobilize and use the technical skills already available to the developed world.

Knowledge

We know that the only acceptable method of controlling population growth is reducing birth rates. We also know this will take time, and education, and money . . . and that the effects will not be immediately noticeable because many of those who will be consuming food in the 1980's are already born.

But we also know that science has provided the means to reduce birth rates. The challenge now is to clear the cultural, ethnic, religious, and educational hurdles.

A strong beginning has been made. Family planning efforts are being organized in a number of crowded, hungry nations. Some, Taiwan and South Korea, for example, have achieved a perceptible reduction in birth rates since inaugurating nationwide family planning programs only a few years ago.

But time is running out. Surveys and rhetoric must give way to crash programs which can spread family planning as rapidly as possible in every country where the fertility of people is outstripping fertility of the soil.

The awareness of the urgent need for family planning—and the demonstrated determination to carry out such programs—offer encouragement that the right approach and the right measures can improve significantly this side of the threatening equation before disaster engulfs us.

We also have the technical skills to solve the other side of the equation. Our own agricultural history, a record of miraculous production gains, shows what can be done. A century ago, one American farmworker met the food and fiber needs of himself and five others. Today he provides for 39. In 20 years, crop production per acre and livestock output per breeding unit have increased about 40 percent. And 1 hour's farm labor today produces five times more than it did in 1921.

What has been done in the United States can be done in the developing countries. But it must be done much more quickly.

Science and research will spur this accelerated effort. The scope of agricultural research underway in our country today—research costing nearly \$900 million last year and embracing nearly 50,000 projects—assures us continuing advances in yield takeoffs, new foods, nutrition, pest control, and conservation. On the strength of achievements to date, and research underway, corn yields

of 200 to 400 bushels an acre are predicted by some for turn of the century agriculture.

There have been breakthroughs in creating new sources of high protein—extremely low cost—food for the world's malnourished . . . food made from rough fish and from soy, cottonseed, and peanut products that are now largely wasted . . . food that can be made into new or familiar dishes.

Then, too, there is an exciting development in high protein, high vitamin food stock extracted from a combination of crude oil, bacteria, yeasts, nitrogen, phosphate, and water. Though this is still in the test tube stage, there are high hopes that in the years ahead this product can be made into low cost food which tastes like fish or meat.

The new high-lysine corn is not only an important source of protein in itself, but also promises a sharp reduction in the cost of producing animal products. Pigs gain weight 50 percent faster on high-lysine corn. This, in turn, promises increased pork products for the protein-starved diets of the hungry nations.

The sea holds out still another food resource that science is tapping—the calculated cultivation and planned harvesting of fin and shellfish . . . and the conversion of seaweed and algae into nutritious food substances.

Resources

What other resources can we muster in the War on Hunger? The "conventional" weapons, of course . . . the food products of our own and other advanced agricultural nations—those nations still capable of producing beyond their own domestic and commercial export requirements. With these food products we can buy time and prevent the threat of famine while modern agricultural techniques are being exported to—and adapted by—the developing countries.

Our own agriculture, healthier than it has been in decades, has reached near supply-demand balance—to the benefit of farmer and taxpayer alike. The Food and Agriculture Act of 1965 and the Food for Freedom program have given our agriculture the flexibility it needed to achieve stabilization and to respond quickly to the rise and fall of demand. Now, for the first time, we are able to establish an authentic food budget. We can determine what domestic demand, commercial export requirements, and food aid needs will be . . . and gear our production accordingly.

Though our surpluses are gone, we still have some remaining reserve acreage to call upon as needed.

But these great conventional resources of the devel-

oped nations—invaluable as they are as a stop-gap averter of famine and malnutrition in the developing countries—will not be enough to win the War on Hunger.

Our studies show that in the not too distant future all of the productive acreage of all of the advanced agriculture nations will not be enough to meet the food needs of the hungry nations . . . if the population juggernaut is not slowed.

If my analysis is correct—and the world *does* have the knowledge and the technical skills to balance the equation and feed itself while modern agricultural methods are being adopted by the developing countries—then the question becomes: Do we have the determination and the will to do what *can* be done to win the War on Hunger?

Only time will tell. But I think we do.

Guidelines and Policy

The United States has declared all-out War on Hunger. Three times in less than a year, President Johnson has spelled out the dimensions of the world food problem and explained what must be done by the underdeveloped and the developed nations to win that war.

These three powerful messages have set the guidelines to victory as they summoned the entire world into action.

The sign posts marking the guidelines are clearly defined. They are: Self-help by the developing nations, multilateral assistance by the developed countries, greater efforts by international organizations and the gearing of individual governments to apply assistance more effectively, and greater contributions by the private sector of the developed world's economy.

Self-Help

Recognizing the foreseeable limit to the developed world's ability to provide enough food aid for the hungry nations to survive, the President's messages call for the developing nations to recognize that, in the long run, they must become able to feed themselves . . . that vigorous self-help efforts to boost their own food production to self-sustaining levels must be launched if they are to expect more than emergency aid from this country.

Self-help, the President said, is the "lifeblood of economic development." Without it, no sustained progress is possible. The recipient nations *must* demonstrate a national determination to improve their own economies by first improving their own agricultures.

It will not be easy. They must compress into years what we took a century to accomplish . . . into months what we took years to do. Yet it *must* be done. And it

can be done. Some of the more successful developing nations already are increasing their food production at a greater rate than was ever achieved by us, or any other advanced nation.

All developing nations are now being challenged to emulate and surpass that feat.

Multilateral Assistance

But while they are trying, they must receive accelerated, *multilateral* assistance. We are encouraging other developed nations to join with us—on a proportionate basis—to contribute their products, finances, services, and talents. Already we are seeing this concept take shape in the consortium approach to food aid for India.

If we are to win the War on Hunger, the President said, all nations—rich and poor alike—must join together and press the agricultural revolution with the same spirit, the same energy, and the same sense of urgency that they apply to their own national defense. Nothing less, he said, is consistent with the human values at stake.

Organizational and Governmental Gearing

Realization of the gravity of the situation is eliciting a substantial response from many quarters. Our own goal in the Department is to mobilize all the resources of the U.S. agricultural community in an effort to provide enough food for that two-thirds of the world still hungry. The USDA's International Agricultural Development Service was established for the specific purpose of mobilizing these resources and coordinating our response to requests from the Agency for International Development.

Increasingly, AID is asking the Department to assume more responsibility in the agricultural development effort abroad. In some countries AID has asked us to assume responsibility for the entire agricultural development effort; in others we undertake particular areas of activity within the overall effort.

We have in the Department a surprisingly large share of the world supply of agricultural brainpower—some 45,000 skilled professionals—agronomists, entomologists, agricultural economists, and geneticists. In addition, we work in concert with the land-grant institutions when mobilizing the complement of skills needed for a particular job. More and more, the agricultural competence of the United States is being utilized in formulating agricultural policies and developing agricultural programs in the developing countries.

The World Bank is shifting more and more of its loans toward the agricultural sector of recipient countries. The Agency for International Development is

sharply increasing its investment in agricultural development projects. The Food and Agricultural Organization of the United Nations is preparing an Indicative World Plan which will outline food needs over the next 15 years and describe what will be required to meet those needs.

But the efforts to win the War on Hunger cannot be limited to governments alone. "The War on Hunger," the President said, "is too big for governments alone. Victory cannot come unless businessmen, universities, foundations, voluntary agencies, and cooperatives join the battle."

This is true because there is, after all, the practical matter of money.

The Private Sector's Role

Investment capital, for the most part, comes not from government but from private business. So, too, is private business the most efficient and effective mobilizer and manager of technology and resources.

Confronted by the dilemma of relatively little remaining new land to till and a shortage of the inputs necessary to achieve significant yield take-offs in land already under cultivation, the developing nations must seek: 1. Enlightened price policies to encourage their farmers to use the necessary inputs; and 2. Measures to encourage profitable investment by private business to develop resources and supply those agricultural inputs.

Recognizing the importance of enlisting private investment in the War on Hunger, the President has proposed the establishment of an Office of Private Resources in the Agency for International Development which would concentrate on marshalling private investment and the expansion of private sectors in the developing world. The President has called this "the best long-term route to rapid growth."

Rapid economic growth by the developing countries promises the developed world a reciprocal benefit the dimensions of which have been largely overlooked. Our studies indicate that as incomes increase in these lands, their imports from us, including farm products, increase steadily. This is why I have frequently referred to the developing world as a "sleeping giant" of trade potential.

Conclusion

These, then, are the major weapons in the War on Hunger: Self-help by the hungry nations, accelerated assistance by the entire community of developed nations, the gearing of individual governments and international organizations to facilitate assistance, and the encouragement of private investment in the developing lands.

Victory in this war promises us:

- The satisfying discharge of our responsibility to the less fortunate of the world.
- The emancipation of mankind from the bonds of chronic hunger . . . and the freeing of all men for the pursuit of self-identification and self-fulfillment.
- A nearing of that global security and serenity which can melt the final barriers between all nations and ensure a lasting peace.

I believe we can win the War on Hunger and build a better world by the Year 2000. I believe this because free men, historically, have had the will to make a better world. All they needed were the means.

And now they have them.

Winston Churchill once said: "In the past we have had a light which flickered, in the present we have a light which flames, and in the future there will be a light which shines over all the land and sea."

That light will shine over a better world than you and I have ever known.

Address at the Overseas Press Club, New York City, February 15, 1967.



AGRICULTURE/2000

SCIENCE IN THE SERVICE OF MAN

In this—the fifth in a series of messages I shall deliver this year on agriculture's role in helping us prepare for the 21st century—I intend to explore the contributions of agricultural science . . . past, present, and future.

I'm pleased to make this speech before this particular audience, for the science-education community understands and appreciates the importance of agricultural science to the welfare . . . indeed to the survival . . . of mankind everywhere.

You understand its complexities . . . and appreciate its sophistication. No one here, I'm sure, has as simple a conception of agricultural science as the woman who declared she was going to cross a pig with a homing pigeon to get bacon that brought itself home.

Seriously, all too few Americans are aware of the tremendous contributions of agricultural science. Too many conceive of the USDA as a body exclusively devoted to the administering of farm programs.

The truth is, of course, that two-thirds of the Department's annual expenditures and about 90 percent of its man-hours are devoted to services of benefit to all Americans rather than exclusively for farmers.

Of USDA's fulltime employees, for instance, about 17 percent are in research agencies, while fewer than 6 percent work in the Agricultural Stabilization and Conservation Service—the agency that deals almost wholly with farm programs.

It's time, then, to tell the wonder story of agricultural research . . . and of how that research affects the lives of all of us today, next month, and in the years to come.

No one knows exactly what agricultural science will have accomplished by the Year 2000, of course, but I do know that today's research is laying the foundation for the kind of agriculture . . . and the kind of world . . . we can have 25 or 30 years from now.

Certainly science can't create an ideal world without the help of far-visioned policymakers, peacemakers, and all men of good will. But just as certainly, the policymakers and the peacemakers won't have the kind of world we'd like by the turn of the century unless research frontiers are extended to achieve those things that are now only theoretically possible.

For the next few minutes let's assume that those research frontiers will be pushed back . . . that the most advanced ideas of our scientists will have reached the stage of practical application by then. Let's dream about what agriculture and the world *can* be like in the 21st century.

The Future

Whirling overhead in the Year 2000 will be the agricultural space satellites that will supply the basic intelligence for agriculture.

While the farmers of tomorrow study reports in their air-conditioned offices . . . relieved at last of the physical drudgery and occupational anxiety so traditionally theirs . . . and the Secretary of Agriculture takes unaccustomed ease at his desk in Washington . . . these shiny space satellites, equipped with the most sophisticated remote sensing instruments, are supplying the information needed to make the key decisions.

Their sensors are able to detect differences in soil . . . identify different crops and kinds of forest trees . . . determine damage by diseases, insects, and drought . . . and assess crop stands and vigor in order to predict production.

Information gathered from throughout the world is transmitted to computers for analysis and immediate use.

The soils of the world have been inventoried, and each crop is grown either on the soil best suited for it, or on soil chemically modified for maximum productivity. We have a running inventory of acreage and output of all crops, and we use accurate predictions to guide marketing and distribution to avoid waste and local shortages and surpluses.

Let's see how this works. Suppose the control station requests a check on the maturity of the North American wheat crop. A signal is sent to the spacecraft sensor, and within a few minutes the results are in. The grain in Oklahoma is ripening fast and threatens to glut local markets. So information goes out to farmers to enable them to manipulate artificial light and apply growth-regulating chemicals to slow the maturity of the Oklahoma wheat . . . and to speed ripening in part of Kansas to meet a scheduled shipment overseas.

Homeowners, incidentally, will use the same light-manipulating and growth-regulating chemical techniques to keep their lawns and shrubs at desired height without mowing or clipping.

I said the spacecraft sensors could also determine crop damage by insects, diseases, or drought, but the truth is that scientists will seldom have occasion to measure such damage in the 21st century.

Combination of biological and specific chemical methods by then will have eradicated the dozen insects that caused half the losses in the sixties, and will control the 100 or so other crop-damaging bugs.

Americans of the Year 2000 never will see—much less swat—a housefly or a mosquito.

Using knowledge gained in 1967 that certain plant proteins control disease resistance, scientists of the Year 2000 will have bred crops and trees and ornamentals that are unaffected by the plant diseases we know. Weeds will have become laboratory curiosities, for harmless chemicals will have been developed to keep their seeds from germinating.

The woodlands are more beautiful, more productive, more used in the Year 2000 than they have ever been before. In 1967, projections were made which foresaw that by the turn of the century America's needs for recreational land would increase 300 percent, for wildlife refuge 133 percent, and for reservoirs 180 percent. The USDA's Forest Service research and development program has helped meet those needs.

New methods of timber harvesting, pioneered in the sixties, are saving billions of cubic feet of timber once wasted in harvesting. New uses of low-grade timber are bolstering local economies, and the mechanization of reforestation, forest culture, and timber harvesting is increasing timber workers' income. Water shortages have been eased by tapping deep snowdrifts in alpine fields.

Lightning fires have been curtailed, parasite and predator damage to trees biologically controlled, tailor-made trees developed, and a wide assortment of new paper products and wood chemicals developed.

Now let's look at the farmland of the new century.

Much of the land presents a striped pattern, for crop rows are separated by impervious strips that catch rainfall and drain it to nourish the plants. Whole hillsides of unproductive land are treated to shed previously wasted rainfall and deliver it to reservoirs serving small towns and recreation areas. And the surfaces of reservoirs and lakes are treated to eliminate loss of water by evaporation.

Irrigation is completely automated and controlled by computers, and the water used in irrigation is treated water from poor-quality sources. Fresh water supplies of the 21st century are largely restricted to domestic and recreation use.

Few livestock are visible, although the United States now produces twice as many as in the sixties. Livestock are now kept in the environmentally controlled shelters that dot the landscape. More people are eating meat, for cattle, hogs, and sheep grow to market size on a third

less feed and in a third less time. Hens, kept on an 18-hour cycle, lay not 240 but 350 to 400 eggs a year.

Most of the crops of the 1960's are still being grown . . . but by now each cornstalk produces multiple ears, and cotton plants grow with all of the bolls clustered on the top branches for easy harvesting. Crops have been bred to need a fraction of the water required by varieties of the sixties, and are much less affected by drought. Plants grow and mature much faster and have been redesigned with sturdy stems and with all leaves exposed to the sun for maximum use of light.

Federal and State scientists of the sixties got the first leads on how proteins, the building blocks of life, are formed in living cells, and their 21st century counterparts direct genetic development of plants and animals, adding desirable new qualities and eliminating defects.

In the 21st century we may find that no more than 2 million of the 300 million people in America are farmers. Computer-controlled machines plant the crops, fertilize by prescription, determine when produce is ready for market, harvest on order, and grade and package the commodities for delivery by supersonic cargo planes to fully automated warehouses.

And—despite the size and the cost of these farms of tomorrow—they are still, by and large, family owned and operated, for by the Year 2000 a creatively flexible system of financing has been devised to meet the much heavier farm credit needs of that era . . . and automation has reduced the required number of human workers to a minimum.

We may be surprised to discover, however, that despite the continued numerical decline in numbers of farmers, the countryside is more heavily populated than it has been for more than a century.

The historic migration from the countryside to the city came to an end before the turn of the century, when far-visioned businessmen, industrialists, government leaders, and social scientists joined forces to restore economic opportunity—and economic appeal—to rural America . . . thus spreading out the populace and relieving the strain on congestion-troubled cities.

The sprawling strip cities predicted by many back in the sixties, contiguous metropolitan complexes extending over hundreds and hundreds of miles, stopped spreading. Instead, our 300 million people are dispersed across the Nation . . . many of them living in brand new towns and cities of planned, manageable, healthy, and esthetically satisfying proportions.

Long Range Study

This view of what agriculture and the countryside may

be like in the 21st century suggests some of the contributions agricultural science can make to the prosperity, comfort, and well-being of mankind throughout the world.

But these achievements will not happen by themselves. They will result only from decision, determination, imaginative planning, and skillful use of scientific resources.

This is the challenge.

Happily, the decision, determination, imaginative planning, and skillful use of scientific resources are already manifest.

We know this is the kind of world we want. *We are* determined to have that kind of world. The planning already *is* underway. And the skillful use of scientific resources is a demonstrated, historical reality that can grow increasingly more effective if we are wise and courageous and determined.

The Department of Agriculture and the land-grant colleges and universities have developed a long-range plan which is guiding the direction and evolution of agricultural science. The plan grew out of a study made by the USDA and the State agricultural experiment stations.

First, 10 goals for agricultural research to meet national needs were determined. Our goals include efficient production of farm and forest products . . . expanding export markets and assisting developing countries . . . raising the level of living of rural people . . . and others.

Then we made an inventory of agricultural research being conducted by USDA, the States, and industry. We determined how effective our present efforts are in meeting our goals, and laid broad plans for making necessary adjustments. Next we integrated our research plans into the Federal budgeting process. All of this has been accomplished within the past 18 months.

Now Federal and State scientists are taking a closer look at each of the 91 research problem areas we have identified. They are charting the course of investigations to solve these problems—such as alleviating soil, water, and air pollution . . . and developing new food, feed, and industrial products from agricultural raw materials . . . assuring adequate supplies of forest resources . . . building lasting economic strength in rural America.

I have every confidence those problems will be solved . . . *because the unique working partnership between the USDA and the State agricultural experiment stations has been solving problems for nearly 100 years!*

I doubt that many Americans realize what that working relationship has meant to the economic, industrial, educational, and scientific development of this Nation.

The Contributions

USDA research is carried out in Federal facilities, in combined State-Federal facilities, and in facilities provided by the States. USDA research scientists and administrators devoted 4,422 man-years of effort to the Department's agricultural research in fiscal 1965.

The State agricultural experiment stations are the centers of agricultural research in every State. They conduct systematic, scientific, organized study concerned with immediate and long-range problems of agriculture, forestry, rural living, resource development, and consumer problems related to agricultural products.

The States turn out a growing volume of research information. Their 6,500 research scientists publish thousands of research or technical papers a year in most of the biological, chemical, engineering, and social science disciplines. Research findings are quickly disseminated by the closely related Cooperative Extension Service.

Let me quickly review what has happened in the United States since this great cooperative agricultural research effort between the USDA and the States was launched back in 1887.

A century ago, 7 million farmworkers served a total population of 31 million. By 1910, farms employed 13 million in a Nation of 106 million. But today—with a total population of 197 million—roughly twice as many as 50 years ago—fewer people are employed on the farm. But as population rose, and farm jobs declined, our people became better fed, better clothed, and better housed than ever before. I should quickly point out, too, that while farm employment is less than 6 million today, another 28 million Americans are employed in farm-related jobs . . . food processing, transporting, marketing, for instance, and chemicals and machinery.

The scientific and technological revolution in agriculture freed millions of Americans to enter other pursuits . . . thus providing the labor force for the industrial explosion in America. Progressively the application of agricultural research has freed more than labor. It also freed capital for the development of the industrial economy. Funds for investment came first from the capital that farmers accumulated when they began producing beyond their own needs.

During this period, agriculture took the lead in opening the scientific frontier. Success in agriculture pointed the way toward the "industry of discovery"—toward the conviction that the economy, the government, the lives of the citizenry can be changed by organized research efforts.

The point has been so well made that today massive

investments in all kinds of research are almost taken for granted. One illustration: In 1940, the Federal Government spent a total of only \$74 million for research and development. Last year the Federal Government spent \$16 billion for research and development .

The research thrust in agriculture has not lost impetus as other thrusts have gained it. In 1965, total expenditures for agricultural research—public and private—came to \$850 million. There are an estimated 30,000 or more agricultural research projects underway in this country today.

And now let's look at some of the results of agricultural research.

Productivity

The impact of research and science on production is almost unbelievable. In the past 20 years, crop production per acre and livestock production per breeding unit have increased almost 40 percent. And this, mind you, has been accomplished with a labor force that diminished almost 40 percent.

In 1945, we produced 2½ billion bushels of corn on 77 million acres. In 1965, we produced more than 4 billion bushels on nearly a third fewer acres. In 1945, the average milk yield per cow was 5,000 pounds a year. Today it is 8,000 pounds. Our markets for dairy products are now supplied by some 10 million fewer cows than were needed 20 years ago.

Our farmers market seven times as much broiler meat and twice as many pounds of turkey as they did in 1945. And they increased the output of red meat almost 40 percent in the same period.

This remarkable record of production efficiency has given the American consumer the best diet in the world at the lowest real cost. Food for Peace and Food for Freedom have saved the lives of millions of famine-threatened people overseas. Sharply competitive in the world market, last year's farm exports set an alltime record. They provided our farmers with 1 dollar of every 6 they earned in cash receipts, and were the most significant single factor in the struggle to maintain our balance of payment position.

Other Research Benefits

The impact of agricultural research is felt far beyond our domestic and international economy. Agricultural research is of crucial importance in man's efforts to create a balanced and diverse environment . . . in improving human health . . . and in examining the life process itself.

How many people know that it was USDA scientists who were the first to link an insect vector to the spread of any disease? In tracing the cause of Texas cattle fever to the fever tick, they opened the way for the control of such human diseases as malaria, yellow fever, and sleeping sickness.

How many know that techniques for mass production of penicillin, and subsequent other wonder drugs, were developed in USDA laboratories?

How many know that research work at the Wisconsin Agricultural Experiment Station led to the discovery of niacin, the cure for pellagra; to the importance of iodine in metabolism; to the discovery that vitamin D could be supplied by direct irradiation of ultraviolet light—a revolutionary finding in basic research and an immediate method for eliminating rickets, not only in farm animals, but also in humans?

How many know that it was a researcher at the New Jersey Agricultural Experiment Station who discovered streptomycin, the first of the wonder drugs to show hopeful results in the treatment of tuberculosis?

And how many know that it was the work of Agricultural Experiment Station researchers in North Dakota and later in Wisconsin that led to the isolation and identification of dicumarol, a compound now widely used in treating circulatory disturbances in man? Some estimate that use of this drug saves the lives of one of every three Americans stricken with coronary thrombosis.

Immediate Problems

Proud as I am of the achievements of agricultural science, I must emphasize that our research job is far from done—and probably never will be. New applications are constantly being found for well-established research principles. And the new insight provided by basic research is continuously opening additional opportunities for extending the benefits of science.

In addition, the problems to be solved don't diminish. There are old problems not satisfactorily solved . . . such as control of soil erosion. There are problems that refuse to stay solved. For example, we breed a disease-resistant crop variety, and then a destructive new strain of the disease develops. And there is a steady flow of new problems arising from changes in our needs and wants, and from the requirements of our economic system.

I would like to mention a few of our research efforts to meet these immediate problems of agriculture.

Even though our agriculture as a whole is highly efficient, certain segments need help in cutting costs in order to compete favorably on domestic and world mar-

kets. For example, we have intensified our research attack to remove the limitations to efficiency in producing cotton. We are breeding new cotton varieties that more nearly meet the requirements of the automated textile industry, developing biological weapons against the boll weevil and other insects, seeking better tillage and disease-control practices, and designing more efficient equipment for ginning and processing cotton.

With seasonal labor scarce in the vegetable industry, growers must mechanize harvesting—and we are undertaking the difficult task of designing satisfactory machines for the vegetables, and sometimes vegetables to match the machines.

Achieving the same standards of efficiency in beef production that have been reached in the poultry industry is another problem now being challenged by our researchers.

Research to prevent pollution of soil, water, and air has been greatly expanded by the Department and the States. We are devising biological and other safe ways of controlling pests . . . developing highly specific pesticides and accurate methods of application . . . and conducting a nationwide program of monitoring to identify any potential hazard to the environment from pesticide usage.

The USDA has been most pleased to cooperate with your organization in the distribution of educational materials on pests and pest control. An information packet was prepared in consultation with National Science Teachers Association, and included a review by your evaluation committee. Although the packets were sent out only recently, science supervisors and instructors from schools and colleges throughout the country already have requested and received more than 100,000 copies for use in their classrooms.

Lastly, we are directing more of our research to the problems of low-income rural families . . . research to improve nutrition, assist in household budgeting, and provide practical housing.

The War On Hunger

And now let me touch on the greatest of the contemporary challenges of agricultural research—World Hunger.

You've heard the grim statistics before. Two-thirds of the world's people go to bed hungry. By the Year 2000, another 3 billion may people the earth . . . and four-fifths of the additional people will be living in those regions where food already is in short supply.

We now know that the United States and the rest of the developed world do not have the food production capacity to fill the gap between population growth and food production in the developing nations very much

longer. Mass famine threatens these nations.

We also know that there can be no peace and no security in a world where two-thirds of the people are thus threatened.

What can be done?

There is only one answer. The hungry nations of the world must learn to feed themselves before time runs out. We must export our technical skills and help them to learn . . . and, together with the other developed countries, we must buy time with our food aid while they are learning.

American agricultural research already is at work all over the world teaching irrigation, drainage and reclamation, pest control, and use of fertilizer, hybrid seed, new plant strains, growth regulators and new tools. During the last 2 years we've had more than 100 of our Agricultural Research Service specialists overseas . . . helping technicians in hungry lands find solutions to their agricultural problems through systematic research effort.

Since 1958, we have financed some 370 research projects in 30 countries, projects that benefit agriculture in our own country as well as in the hungry lands. And we are bringing increasing numbers of technicians from other nations to our country for special training.

And while we are doing this, our researchers are exploring new ways to supplement the diets of protein-starved people, who now number more than 2 billion!

Protein-starved children die . . . sometimes at a rate 40 times higher than children of the same age in developed countries. Or they are physically stunted. Or mentally retarded. And those who survive to adulthood may suffer chronically poor health.

One promising approach to this problem is a USDA process for fortifying wheat or other grains with extra proteins. Essential amino acids that make up nutritionally adequate proteins are infused into the grain in soluble form. The enriched grain can then be processed for use in the familiar foods of the developing countries. Purdue University researchers have bred lysine into a new strain of corn, and I predict we'll soon be able to do the same with wheat. Such a nutritional breakthrough would dwarf even space exploration or putting a man on the moon in its ultimate impact on the future of mankind.

An entire speech could be devoted to the dramatic advances in processing protein concentrates from soybeans, peanuts, or cottonseed. These concentrates can be made to simulate meat, fish, or poultry, and ultimately could provide a new source of quality food, at low cost, for millions of the world's hungry people.

All of these breakthroughs offer solid hope that the eternal war on hunger eventually can be won . . . per-

haps before the Year 2000.

Conclusion

The scope of agricultural research defies description in a thousand speeches. All I could hope to do today is give some indication of its awe-inspiring dimensions.

And those dimensions must continue to expand . . . if we are to build the kind of world we seek by the Year 2000. Federal, State, and industrial research in agriculture now employs about 27,000 scientists. Meeting the goals we have set will require an additional 13,000 agricultural scientists by 1972 . . . and about 13,000 more by 1977.

We will need the most dedicated, innovative, and far-visioned scientists we can find, and we ask your help in finding them. The need is so crucial, the pressure of time so imperative, that I take this occasion to implore you—the science teachers of America—to direct as many of your promising students as you can into careers in agricultural science.

With their help, we *can* move into the wonder world of the 21st century . . . a world where mankind, freed at last from the desperate struggle to survive famine, pestilence, and fever, can finally pursue those higher goals his God-given nature inspires him to seek.

“The truth,” Franklin Roosevelt once said, “is found when men are free to pursue it.”

Now, as I close, let me leave you with this thought. It is within the gift of science to set men free in a wonder world . . . if science remains in the service of man. But magnificent as science is, as fulfilling as science is, it must never be deified for its own sake. Always it must remain in the service of man.

There is a story that illustrates this point. It seems that a brilliant group of scientists created the ultimate computer . . . a computer equipped for the first time with insight and the potential for abstract reasoning.

To test their awesome creation, the scientists asked it the oldest question in the world: “Is there a God?”

The machine whirred for a moment and then brought forth this ominous answer:

“If there wasn’t before . . . there is one *now*.”

Address at the National Science Teachers Association Convention, Detroit, Michigan, March 20, 1967.



AGRICULTURE/2000

KNOWLEDGE FOR LIVING

My message today, "Agriculture/2000—Knowledge for Living," is the sixth and last in a series exploring the face of America in the Year 2000. And while that year is still three decades in the future, its final shape is being hammered out in the here and now, in a million daily decisions by individuals, business and government, decisions which collectively will determine the course of future events.

What we *do* about the future is important; what we think about it is, perhaps, just as important. It has always been thus in America. Historian Bruce Catton, chronicling the dream of continental empire that dominated the Republic in the early 19th century wrote:

The people could go anywhere they chose, quite literally anywhere; all the way to the undiscovered mountains and the deserts, beyond these to the extreme limit of the imagination. Men could very likely do anything on earth they had the courage to dream of doing.

We still can. We still can do anything we have the courage to dream of doing, if we want to do it badly enough. The Agriculture/2000 series has been an attempt to map part of the future; to point out some of the alternate routes; the rough roads and smooth that we'll encounter on the road to the kind of world we dream about for the Year 2000.

Faces of the Future

The first three of the Agriculture/2000 series dealt with the implications that flow from some known facts: That the United States, in the Year 2000, will be a Nation of from 280 to 350 million citizens; that we will inhabit the same fixed number of square miles as today; that we will live from the bounty of the same thin layer of topsoil that feeds 200 million Americans today.

Extrapolating from this, we explored questions like these: Will Americans live in ever more-crowded urban complexes in the Year 2000, or will population—and the jobs to support it—be more evenly spread over the land than today? We explored the future of the family farm—which, in another 33 years, will be feeding three Americans for every two it feeds today . . . And finally, we explored the impact of a 50 percent increase in population on fixed resources of land, water, open

space, and outdoor recreation in the Year 2000.

The next talk in the series concerned itself with how a world population which will double in the next 33 years will feed itself; and the fifth, entitled, "Science in the Service of Man," discussed the agricultural technology needed so that the abundance that is our greatest national strength today will continue tomorrow.

Each of these talks explored a different facet of the future; each concerned itself with basic Department of Agriculture responsibilities in food production, conservation, rural development, food aid, consumer services, science, and research.

The USDA, of necessity, is a future-oriented organization. The trees that will mature a hundred years from now in the National Forests are being planted today. The soil that will have to feed the next generation of Americans is being conserved by Soil Conservation Service technicians today; the knowledge needed for Year/2000 agriculture is being developed in USDA laboratories in 1967.

Living in 2000

With this in mind, let's open the door and peek at a typical home in the Year 2000.

It's in the countryside, because we've succeeded in dispersing jobs widely over rural America, bringing the factories to where the people want to live, rather than stacking up most of the people in crowded urban complexes, where most of the jobs are to be found today.

The home—part of a cluster surrounded by an open park—is in one of the thousands of "new towns" which now dot rural America, each containing its own shopping center and factories within easy walking or driving distance.

Inside, the home is divided by movable partitions, rather than by rigid walls, to increase or diminish the number of rooms as the size of the family changes.

In the kitchen, one wall contains the refrigerator, a built-in unit with pull-out drawers, each with a different temperature for different foods, each with its automatic defrosting unit. There's still a dishwasher, for, although disposable dishware is used for everyday occasions, most housewives still prefer china when company drops in.

The contents of the refrigerator may startle us . . . square tomatoes bred by plant geneticists for less damage in shipping . . . frozen lettuce and salad mix—preserved by cryogenic advances—with all the flavor and characteristics of today's fresh lettuce . . . instant sandwich mixes.

Contents of the cupboard are even more exotic . . . sheets of freeze-dried catsup, barbecue sauce, gravy,

pickle relish, and syrup, ready to be reconstituted at the housewife's convenience, good indefinitely without refrigeration.

Some of the products look familiar, but are radically different from today's food: High-protein corn products and cereals, bred by plant geneticists . . . meat, tailor-produced for the exact fat content desired . . . milk with whatever butterfat content the family desires for its own dietary requirements.

We'll still like the old foods, but we'll also be trying new flavors. Breakthroughs in the molecular chemistry of flavor are not far away now, and will be an accomplished fact in another three decades, allowing us to intensify the flavor of bland foods; remove objectionable flavors from otherwise nutritious commodities; or even to make an inexpensive food—soybeans, for instance—taste like steak.

On the wall, above the laser-beam slicer, is a hook, but no flyswatter hangs on it. The flyswatter has joined the buggywhip in oblivion, for the common housefly will have been eliminated by new techniques in black light, infrared or magnetic waves, or perhaps bred out of existence by sterilization of the population, much as the screwworm was eliminated by Department scientists back in the sixties.

Harmful insects will be just as rare in the fields where this food is produced, and the fields themselves will be programmed to produce exactly the produce needed, when it's needed, and in the form wanted. Whole fields of vegetables will mature at the same hour, in standardized sizes, to allow machine harvesting, the only kind of harvesting we'll know in another 33 years.

The man who grows this food also will have a big hand in the system which delivers it to the consumer, because he will have taken action, in the seventies, eighties, and nineties, to move his own farmer-cooperatives into the processing-marketing complex to gain for himself a bigger share of the consumer's dollar than he now enjoys.

His cooperatives will be serviced by a central computer system that keeps a running count on the amount of food consumed last year, the amount left in stock, and production needed in season to meet demand.

This system will be wired into an instantaneous market news service supplying current market conditions, much like today's stock market report, a service that assimilates sales, highs, lows, and volumes of transactions for all commodities.

The commodities themselves will be guaranteed for wholesomeness by a Federal-State network of inspection programs designed to guarantee the purity of *all* foods,

regardless of point of origin, much as the present system guarantees the purity of meat and poultry in interstate commerce.

The consumer, meanwhile, will be working less, but enjoying it more. The 30- or 35-hour work week will have become a reality, for most wage earners, and the 1½ trillion dollar gross national product an accomplished fact.

The median family income, measured in constant 1967 dollars, will surpass the \$11,000 a year mark—against \$6,880 today—and 1 family in 4—compared with 1 in 18 today—will be in the \$15,000 a year and up class. The farmer, in command of scarce and highly technical skills needed to feed a burgeoning population, will earn more than that. This will be a matter of necessity, for if we haven't learned by then to reward his skills and investment adequately, we won't have a competitive family farm agriculture, and all the progress we have predicted may never come about.

But some things will still be the same: Expenditures will still rise to meet available income in the average family; the cry of the harassed husband—"where does all the money go?"—will still be heard in the land.

And so some of the same old worries will still be with us—but other worries will have been eliminated. By the 21st century, human nutritional research will have discovered a great deal more about the relationship of heart disease, strokes, and cholesterol levels in the blood stream, tying this knowledge to the food we eat, and thus lessening the incidence of these crippling conditions. (We have already discovered, for instance, that the amount and kinds of fat in the diet may not be as important to the cholesterol level as the types of carbohydrate combined with the fat we eat.)

USDA scientists have already developed a much deeper understanding of nucleic acids, blood antigens, and the fundamental processes of genetics than in the past. Research will probably give us the answers to eliminating genetic defects and diseases. Other USDA scientists, now experimenting with methods to correct defects in animal fetuses, may have found ways for the medical profession to apply their discoveries to correcting human birth defects in the Year 2000.

Knowledge for Living

Meanwhile, back in Washington, the Department of Agriculture will be geared up to answer between 2 and 3 million information requests yearly, rather than the 600,000 we answered last year.

We'll still get questions like this one . . . which actually came in during 1966:

“Can you send me a recipe for home brew? If I can improve my flavor I can get another 25 cents a bottle for it. . . .”

And this one. “I hear there’s a machine that produces eggs without chickens. Can I buy one?”

Our answer will still be “no” to the first request—but quite possibly “yes” to the request for machine-made eggs.

We can expect fewer questions on grades and labeling, because in another 30 years they’ll have become standardized in all parts of the marketing system and all parts of the Nation.

We have the beginnings of such a system today for some foods—the coordinated quality grades for live cattle and for beef, for instance, which make it possible for the producer to tailor his product to meet the wants of consumers—expressed at the retail counter through their large volume purchases of choice grade beef. But we have a long way to go for some other foods. For example, milk with less than 3 percent butterfat in one State must be labeled as “skim,” while in another State milk can be labeled “skim” only if it has less than 1 percent butterfat.

We’ll have a Federal-State network of inspection programs to guarantee the wholesomeness of all foods, comparable to that for meat and poultry products, regardless of where they are produced or whether or not they are shipped across State lines.

The supermarket will be different, too. Rather than stocking items for carryout, it will have become a giant sampling shop, where the shopper picks out what she wants from the display, inserts her credit card into a slot, and picks up her purchases at the door. Bills will be totaled automatically and long waits at the checkout stand will be eliminated.

Perhaps this seems far out. I don’t think so. Actually, it’s probably a rather conservative picture of the future. The technology I’ve discussed in the past few minutes is either already in existence or is now being researched. Many more developments—which haven’t even been thought of yet—will become visible in the future.

Think back, for a moment, to the year 1934, the second year of the New Deal, a year as far in the past as the 21st century is in the future.

Who, save a handful of prescient physicists, foresaw transistors, computers, hydrogen bombs, satellites, and the moon rocket? In the social sciences, who foresaw the explosive growth of the suburbs, the impact of a nationwide television net, reapportionment, civil rights bills, demonstration cities, cold wars, and new nations?

All of these things fundamentally altered the very

character of American life, shattering old patterns, creating new ones. And all the king's horses, and all the king's men can never put it back together the way it was.

The *pace* of change is growing almost geometrically. And so we know that the world of the Year 2000 will be different in kind, as well as in degree, from today's world. To some this is frightening; to me it is challenging and exciting.

The Food-Income Equation

And yet some things won't change. People will still have to eat, farmers will still be growing the food that feeds them, and if we are to maintain the same basic economy of abundance we enjoy today, the producer of this abundance will have to be more fairly rewarded than he is today.

And herein lies a serious threat to our future. Today's prosperity, as in the past, rests on agriculture. Agriculture is one of the top dollar-earners for the United States abroad. Agriculture still is our largest single consumer of goods in the domestic economy. Although fewer than 6 percent of our people live on farms, they feed the rest of our population better, and at lower real cost, than any other people in the history of mankind have been fed.

The 94 percent of our population that is nonfarm is able to devote its time and talent to producing the other items we need and want to live a better, more satisfying life. As a result, this Nation enjoys the highest standard of living in the world, and our prospects for an even better life in the Year 2000 are bright.

But what has been built up can also be torn down. This has happened to other great civilizations, and it can happen here, if we fail to heed the legitimate needs of the American family farmer.

Today that farmer is seriously underpaid—and this cannot long continue. In a full employment, free enterprise economy such as ours, capital and know-how will go elsewhere if they are unrewarded in agriculture. If this happens—if the family farm system is wrecked and monopoly agriculture develops in the United States—the bright promise we predict today for the Year 2000 may well be lost.

This is primary. The system of agriculture that we enjoy today, with ownership, decision-making, responsibility and rewards widely dispersed, in many hands, rather than in just a few, is the most efficient, most productive in the entire world.

Over the past few decades American farmers have increased their productivity at a rate twice that of American industry. Over the same period they have provided the life-saving margin of food for literally millions of

hungry people overseas.

It is this system of family agriculture that must be passed on to the future, if we are to enjoy the same kind of abundance that we have enjoyed in the past. It is this system, rather than monopoly agriculture, that best serves the consumer of today and of the Year 2000.

There's nothing theoretical about it. The consumer has a material, dollars-and-cents interest in preserving the family farm system. This is true today and it will be true in the future. Under this system, the American consumer—despite recent price rises—is eating better food, at a lower real cost, than he ever has before. The average family today spends 18.1 percent of its after-tax pay on food—the lowest average in the world, and by far the lowest in our entire history. In 1947 this same family spent 26 percent. If the percentage of take-home pay spent for food remained the same as it was in 1947, nearly \$39 billion would be added to the Nation's food bill, or about \$800 a year for a family of four.

Let's compare 1960 with today to see how much more we can buy now than we could then. One hour of factory labor earnings in 1966 bought:

12.2 pounds of white bread . . . compared with 11.1 pounds in 1960.

2.4 pounds of round steak . . . compared with 2.1 pounds.

3.3 pounds of butter . . . compared with 3 pounds.

9.7 quarts of milk (delivered) . . . compared with 8.7 quarts.

4.5 dozen eggs . . . compared with 3.9 dozen.

36.1 pounds of potatoes . . . compared with 31.4 pounds.

15.3 cans of tomatoes . . . compared with 14.2 cans.

But today the system that made this record possible is threatened by too-low farm prices. Low farm prices have been prevalent over too many years of this century, but the great difference is that today, in a full-employment economy, with numerous alternative opportunities for employment in the nonfarm sector, the farmer can go elsewhere. And what is true of manpower is also true of capital. Today's advanced agricultural technology requires massive infusions of capital. If returns are too low in agriculture, capital will find investment elsewhere.

Both consumers and family farmers should be aware of this threat. Each has a stake in meeting and resolving it. Thus knowledge for living, in its deepest and most fundamental sense, must include an understanding of the basic factors that influence, for good and ill, the abun-

dance that so many of us take for granted. Facts like these—

First: Last year, despite the second-highest net farm income in national history, and despite a 70-percent increase in net income per farm since 1960, *the farmer's income still lagged one-third behind that of nonfarm residents.*

Second: *Food prices and farm prices are two different things.* It is important that consumers make this distinction.

Last year the *food* price index was *up* 35 percent over the 1947-49 average, but the *farm* price index was *down* 2 percent!

In this same period the average family upped its weekly grocery bill by about \$10.50 a week. Of this increase, roughly \$8.95 went to the marketing sector, only \$1.55 to the farmer.

A homier example of this is found in a loaf of bread. In 1950 the farmer received about 2½ cents for the wheat that went into a 1-pound loaf. Back then the loaf retailed at 14 cents. In 1966, the farmer got about 3 cents for the wheat in a loaf of bread, but the consumer paid 22.2 cents a loaf, national average. And so, while the wheat farmer upped his share of the loaf less than 1 cent, the consumer paid another 8 cents.

Third: In fairness to our processors and distributors, the most efficient in the world, we should take notice as to where some of the added food dollars are going. Many are going for higher costs in all phases of the system . . . labor, taxes, rent, transportation, and other items. Many more dollars are being spent for higher priced foods, extra services at the supermarket, built-in preparation of foods and other items which, in effect, in exchange consumer dollars—not for food as such—but rather for consumer conveniences and improved diets. For instance—

Over the past 20 years, consumption of meat, a relatively high-priced item, has risen 20 pounds a person, but consumption of cereal products, a lower priced item has dropped 25 pounds a person.

The typical supermarket today stocks from 6 to 10 thousand items on its shelves, double the number of 20 years ago. This increased choice costs money. Each year an estimated 1,500 new grocery items are introduced, most of which represent additional processing of farm products. Researching, processing, and stocking these products also cost money, and the consumer eventually pays it.

Convenience foods—to the extent they're purchased by an individual housewife—also add to the food bill, but not to farm prices. A good example is the TV dinner, which retails for about 60 cents. Prepared at home it

would cost 20 cents, and in either case, the farmer gets only about 8 cents of the total at the farm level. These built-in conveniences are a great thing for housewives, many of whom work outside the home today, supplementing family income. Built-in conveniences save them precious time. But preprocessed foods also cost more money.

Fourth: Housewives feel more strongly about food price hikes than they do the climb in the cost of other items. Food is *both* a necessity and a daily item on the household budget.

Medical care also is a necessity and has risen at a rate twice that of the increase in food costs. But medical bills are in the nature of exceptional charges, for most of us, and we tend to accept these increases, albeit reluctantly, while we resent food price increases.

And finally: Many of the items in the grocery bag, which we tend to lump into the food bill, aren't food items at all. Last year, for instance, USDA figures show that about 1 dollar in 10 spent at the grocery store was spent for nonfood items.

According to Sylvia Porter, the nationally syndicated financial columnist, the five fastest growing items in sales in supermarkets are housewares, paper towels, deodorant soaps, liquid laundry starch, and paper cups—all nonfood items. Some 57 percent of our toothpaste is now purchased in food stores.

The Facts Are Getting Through

I'm convinced that many of these facts on farm and food prices have already sifted through to consumers. For one thing, last summer's wave of boycotts and housewives' protests on food prices were directed, in the main, at trading stamps, bingo and other frills, rather than at farm prices. I can't recall a single instance in which the farmer was accused of profiteering at the expense of the consumer.

Another encouraging sign is the removal of the "surplus" label from the American farmer. This epithet dogged him throughout the 1950's when he was pictured, in much of the urban press, as a man with two Cadillacs in every garage and too much wheat and corn in every storage bin. There has been a shift in this false, ill-deserved, derogatory image—never true or fair, but one that existed nonetheless in the minds of many urban consumers. Most Americans are now aware that the farmer is working out his problems. Surpluses are gone. The farmer has new stature as the possessor of the knowledge vitally needed to feed an exploding world population.

The Department of Agriculture, its Secretary, and numerous private groups have worked very hard so that the

consumer's "knowledge for living" would include a fair portrayal of the farmer, his triumphs, and his problems. While this job is far from completed, I believe that we are beginning to overcome many of the misconceptions that formerly stood in our way.

Few consumers, knowing the facts I have just outlined—that the average farmer's income is two-thirds that of urban residents, that farm prices are 2 percent below those of 18 years ago—would argue that the farmer is overpaid. Few consumers, once informed of the miracle of abundance that the family farm system has produced, would wish to trade it for any other system.

I am a believer in this system, and I am optimistic that our goal of parity of income for the adequate-sized family farm will be reached. In the first address in this series, "Income and Abundance," I outlined some of the methods for doing so. With maintenance of our voluntary farm programs, a relatively free market and strong world demand, we are on the right track to achieve this end.

No one can predict the future with absolute certainty—and it is well that this is so. But we can dream. We can hope. We can even project, with some certainty, based on what we know and what we want. This is what I have attempted to do in the Agriculture/2000 series.

Will all of the predictions come true? Time alone will tell. I know only this: That the world of Agriculture/2000 will be a better world than that of 1967. I know this because you—and millions like you throughout the United States—will make it so.

Address before New York State Agricultural Leaders, Cornell University, Ithaca, N.Y., March 23, 1967.



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